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1884

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56

Madurai District Grooon Records.

Volume No: 56

YEAR: 1884

56

1884 - Proceedings and Government orders from Revenue and Agriculture Department to the Deputy Director - Revenue Settlement Party-III

GOVERNMENT OF MADRAS.

ENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 17th September 1883, No. 2789:—

Read—the following Memorandum by H. G. TURNER, Esq., Acting Collector of Vizagapatam, dated 9th March 1883; and endorsement by M. HAMMICK, Esq., Assistant Secretary to Government, dated Ootacamund, 13th October 1883:—

The want of an enactment like the Encumbered Estates Act now in force in Scinde (XX of 1881) and other provinces of India is much felt in this district. The district chiefly consists of permanently-settled Zamindaris and Proprietary estates. These Zamindars and Proprietors are generally very extravagant. As they are possessed of large estates, the money-lenders are always ready to advance them money with the ulterior object of getting into their hands the estates or portions of them.

2. Already the undermentioned estates are more or less heavily involved:—

(1) Mádugula.	(4) Chemudu.
(2) Sálúr.	(5) Pachipenta.
(3) Uratla.	

3. Of these, Mádugula, Uratla and Pachipenta are so heavily encumbered that it is utterly impossible for the hereditary owners thereof to recover them from their present embarrassed condition. Many of the villages of the two latter estates have been sold by the Civil Courts and transferred to the money-lenders. Even the portions that now remain in the hands of the hereditary owners are still heavily encumbered.

4. The Sálúr Zamindar being unable to redeem the estate from its present difficulties has requested the Government to manage the estate on his behalf. The debt on this estate when it was made over by the Court of Wards to the present young Zamindar in 1880 was Rs. 60,000. During these two years, from mismanagement consequent on the incompetency of the Zamindar, the debt has been enormously increased. It now amounts to over Rs. 2,70,000. The number of creditors is more than 25. All the debts are now overdue. The creditors are all clamouring for repayment. It is impossible for Government to satisfy, out of the surplus revenue of the estate, the claims of all these creditors at one and the same time. There is nothing to prevent these creditors from filing suits and taking out execution. The result will be the dismemberment of the estate, which is inexpedient on political and other grounds. Without an Act like the Encumbered Estates Act, it is hardly possible for Government to set matters right in regard to this estate.

5. Further, there is nothing to prevent the Zamindar from incurring fresh liabilities while the estate continues under Government management. What good can result to the estate by Government management if the Zamindar can incur fresh liabilities on one hand while the Government are clearing off the debts on the other? Now Government hold the estate under a power of attorney given by the Zamindar. They are thus only his agents and, so far as I can see, there is nothing to prevent him from collecting the rents of the estate on one hand, while Government are collecting on the other. The Zamindar no doubt promises to abstain from incurring fresh liabilities or from collecting rents from the ryots. But the Zamindar is so timid that he is unable to refuse to sign any paper that may be placed before him by his mother or by her hangers-on. Government cannot prevent him from signing fresh bonds for real or imaginary debts, or from signing receipts for rents collected from ryots. The Encumbered Estates Act in force in other provinces provides for all these difficulties. It renders the Zamindar, while

the estate continues under Government management, incompetent to incur fresh liabilities or to give receipts to the ryots for rents. It divests the Civil Courts of power to entertain suits against such estates and gives power to Government to settle the claims of the creditors.

6. The Chemudu estate has been under usufructuary mortgage for a heavy debt, and it is now in the hands of the mortgagee.

7. If it is the wish of Government that the permanently-settled estates should be preserved intact, it is highly desirable that the provisions of the Encumbered Estates Act in force in other provinces of India should be extended to this presidency. Such an enactment will not only save the estates already on the verge of ruin, but the very fact of the existence of such an enactment will be enough to save many an estate from becoming encumbered. The very knowledge of the existence of the Act will operate as a wholesome check on money-lenders and its provisions need seldom be enforced.

8. It is true that when an estate becomes encumbered from the extravagance of its holder, he ought to suffer the consequences of his own imprudence. But two considerations outweigh this—firstly, the ancient Zamindaris are of the nature of estates-in-tail. The Zamindar has no more than a life-interest. It is not right that the successor should suffer the consequences of his predecessor's folly and be rendered unable, on account of the debts contracted by his predecessor, to perform the proper function of a landlord, to the detriment of the interests of himself and of the people committed to his charge; secondly, it is desirable that these estates in a district like this should, on political considerations, be preserved in the hands of the descendants of the ancient families. Many of these estates spread into the hills, and there is much danger of an outbreak when the hillmen are subjected to the exactions of some low-country usurer. I have brought the necessity of this measure to notice on one or two occasions in letters to the Board of Revenue, and all that is wanted is discussion of the measure by officials of experience to determine whether or not the Legislature should take the action I propose.

Transferred to the Chief Secretary to Government for disposal.

(By Order.)

GOVERNMENT HOUSE,
OOTACAMUND,
7th April 1883.

(Signed) A. AWDRY, Captain, R.E.,
Private Secretary.

No. 773.

Referred to the Board of Revenue for remarks.

(By Order.)

OOTACAMUND,
17th April 1883.

(Signed) M. HAMMICK,
Acting Assistant Secretary.

Resolution—dated 17th September 1883, No. 2789.

With the above communication, the Government forward for the remarks of the Board a memorandum submitted by Mr. Turner, Acting Collector of Vizagapatam, to His Excellency the Governor, during his late tour, advocating the enactment of a law, similar to the Encumbered Estates Act in force in Scinde and other provinces of India, for the protection of the Zamindars of his district. In connection with his proposals for extricating the Zamindar of Sálúr from his pecuniary embarrassments, Mr. Turner had brought this subject to the Board's notice, but they did not consider that there were in the circumstances of the particular case sufficient grounds for advising Government to take legislative action in the matter. Mr. Turner, however, was informed that he was at liberty to address them again on the subject in a separate communication, explaining fully his reasons for the exceptional legislation advocated by him.

Board's Proceedings, dated 2nd April 1883, No. 914.

2. In his memorandum now before the Board, Mr. Turner states that the Vizagapatam district consists chiefly of Zamindaris and Proprietary estates; that the Zamindars and Proprietors of these estates are generally very extravagant and at the mercy of money-lenders who readily advance them money with the view eventually of getting possession of their estates or portions of them; that many of the estates are already very heavily encumbered and likely soon to fall to pieces; that it is impossible for the hereditary proprietors of the estates to rescue them from their embarrassed condition; and that if it is the wish of Government that permanently-settled estates should be preserved intact, it is highly desirable that the provisions of the Encumbered Estates Act in force in other provinces of India should be extended to this presidency.

3. The Board have given very careful consideration to this important question, but are unable to give their support to Mr. Turner's proposal. If, as he puts it, it is the wish of Government that permanently-settled estates should be maintained in the hands of Zamindars, in spite of their reckless extravagance, there can be no doubt that an Act like the Scinde Encumbered Estates Act (XX of 1881) would enable the object to be attained very effectually; for the moment the Act is applied to any estate the proprietor becomes legally incompetent to manage it; the operation of the Civil Courts in regard to all transactions connected with it is suspended; and the Collector acquires plenary powers to settle the debts in such manner as he may deem proper and to keep the estate under his management till the debts are liquidated. It is evident, however, that the very drastic character of the remedy would need an altogether exceptional state of circumstances to justify its application. The ruin of ancient families, as indeed of all families which have for any length of time occupied distinguished and influential positions, however brought about, is always a circumstance which for the moment naturally excites much sympathy and commiseration, but such special legislation as that proposed must have for its justification some paramount necessity and not merely a transient, and perhaps false, sentiment. Setting aside then the consideration due to ancient families as such, the question of legislation may be viewed in four aspects, viz., in its effect (1st) upon the Zamindars for whose protection it is intended; (2ndly) on persons who have lent, or may hereafter lend, them money; (3rdly) on the condition of the ryots on their estates; and (4thly) as a measure of political necessity for the safety of the State; and the Board consider that, so far as this presidency is concerned, in none of these respects is the proposed legislation called for.

4. As regards the first point, it must be observed that the Hindu law of equal division of inheritance among children applies to all Proprietary estates and Zamindaris excepting ancient estates of an impartible character, and eventually the dismemberment of all permanently-settled estates with the above exceptions, cannot be arrested though it may be staved off for a time by legislation of the kind proposed. Moreover, even in regard to ancient estates, it is difficult to say that the rule of primogeniture always applies. In the case of the large and ancient Zamindari of Núzvíd, which was supposed to be governed by the rule of primogeniture, the Privy Council recently decided that it was not so, and that the ordinary law of equal division of inheritance applied. Nothing, therefore, short of an enactment strictly entailing permanently-settled estates on the eldest branch of the families or in tail male would prevent their being broken up; but such a law, besides revolutionizing the Hindu law of inheritance and depriving the junior members of the family of their just rights, would be in direct opposition to the terms of the sanads on which the estates are held and of Regulation XXV of 1802, the professed object of which was to confer on Zamindars rights of full proprietorship with liberty to alienate or transfer their estates or portions of them, provided the exercise of such rights was not inconsistent with the provisions of Hindu or Muhammadan law. Sir Thomas Munro during his Governorship advocated the passing of an entail regulation for preserving ancient Zamindaris intact; but, probably in view of difficulties in determining to what estates the law should be made applicable, the project was abandoned. The law of entail, the Board believe, has elsewhere been found to be not altogether beneficial to the interests of the general public, and the

Vide Selections from the Despatches of Sir Thomas Munro by Sir Alexander Arbuthnot, Vol. 1, pages 117, *et seq.*

tendency of modern legislation has been to confine it within the narrowest possible limits. Without a law of entail, however, a Zamindar cannot be restrained from selling portions of his property, and if he can sell them, it is difficult to see why he should be restrained from charging or encumbering them. The Board consider that where the sole cause of a Zamindar's difficulties is, as is almost always the case, his profligate extravagance, the Government only aid, abet, and encourage that extravagance by interposing to protect him from the natural consequences of his misconduct, for no other reason than that he is a Zamindar. Such interposition, when it takes place in pursuance of a settled policy, must, in the long run, have the effect of weakening the sense of responsibility in Zamindars to manage their estates efficiently, give rise to constant appeals from them to Government to extricate them from their difficulties by relieving them of the management of the estates which they have brought to the verge of ruin, and necessitate their being continually maintained in a state of tutelage. Of the five estates mentioned in Mr. Turner's memorandum as being heavily encumbered, Mádugula is under the management of the Court of Wards, who are doing their best to put its affairs in order, and Chemudu was, until lately, also in their charge. Sálúr was, for a long time, under the management of the Court of Wards and was handed over to the Proprietor only in 1879 with a cash balance of Rs. 15,000, after paying all debts except a sum of Rs. 60,000 repayable by instalments, and the Zamindar, in the course of three years, has not only managed to spend the whole of the cash balance in addition to the annual income of the estate, but to run into debt to an amount exceeding two lakhs of rupees. The Uratla estate was, with the consent of the Proprietor, managed by the Collector with a view to extricate him from his difficulties, with the result that a considerable portion of the Zamindar's debt was paid off and the estate was handed back to him on his giving an assurance that he would manage it properly henceforward, yet, since it was given over to him, his debts have again accumulated. These examples show that when Government, after years of assiduous nursing, succeed in putting the affairs of an estate into order and hand it back to the owner tolerably free from liabilities, there is no guarantee that he will not relapse into his former habits of extravagance and plunge the estate once more into difficulties. There is now, at least, the wholesome fear among Zamindars that they will in the end have to suffer the consequences of their inefficient management, however insufficiently that fear may operate in most cases, but when once it is declared, as a matter of settled policy, that however reckless their conduct may be the Government always hold themselves in readiness to shield them from the consequences of their folly, there will not be any incentive whatever to future amendment. Mr. Turner admits that when an estate becomes encumbered from the extravagance of a Zamindar, he ought to suffer the consequences of his own imprudence, but remarks that an ancient Zamindari is of the nature of an estate-in-tail; that the Zamindar has no more than a life-interest in it, and that it is not right that the successor should suffer the consequences of his predecessor's folly, and be rendered unable, on account of the debts contracted by him, to perform the proper functions of a landlord, to the detriment of the interests of himself and of the people committed to his charge. The law in regard to impartible Zamindaris, as laid down in recent decisions, appears to be that a Zamindar has only a life-interest in his Zamindari, and that his debts are not binding on the reversioner *unless* contracted for the benefit of the estate, excepting when the reversioner is a son, in which case the debt is binding if it was not contracted for immoral or illegal purposes. Doubtless, when the son succeeds to the property of his father burdened with debts, he is at a disadvantage, but of this he can hardly complain, as it is the operation of the same Hindu law which gives him the reversionary interest in the estate, while at the same time it imposes restrictions upon the reversion which greatly neutralize its value by making it subject to payment of debts. The question whether, when, irrespective of the rights of the reversioners, a Zamindar so grossly neglects the duties of a landlord as to impoverish his tenantry, he should not be compelled to perform his duties, is a separate one and not connected with the proposed legislation.

5. As regards the effect of the proposed legislation on persons who have lent money to Zamindars, their interests are in a great measure sacrificed to those of the

latter, as the payment of their claims may be indefinitely postponed under the settlement made by the Collector. The persons who lend money are not always professional money-lenders, for in some of the very cases above referred to, large sums have been lent by other Zamindars; nor is it the case that all money-lenders are usurers and profit by driving unconscionable bargains with confiding Zamindars. Mr. Turner considers that the very existence of an Encumbered Estates Act, by diminishing the credit of the Zamindars and their facilities for borrowing, will render its frequent application in practice unnecessary. So long, however, as Zamindars are not actually prohibited from borrowing, a more probable result of putting the Act in force occasionally would probably be to drive the more respectable money-lenders out of the field and place the Zamindars at the mercy of the lowest class of usurers, who would take to money-lending as a gambling speculation, and, in view of the uncertain character of the security offered, would impose harder conditions on their debtors than ever.

6. Adverting to the question whether the proposed legislation is necessary in the interests of the ryots of the Zamindaris, the Board do not find that the Zamindari system is possessed of such intrinsic merits as to deserve to be perpetuated at all hazards. The evidence available is entirely the other way. The inquiries instituted into the working of the Zamindari system in Rajahmundry district by Sir H. Montgomery in 1845,* and again by Mr. Walter Elliot in Guntúr in 1847,† disclosed flagrant abuses, and though with the general improvement of the country, the condition of the ryots in the Zamindari tracts has also improved, this state of things has been brought about, not in consequence of the good management by Zamindars of their estates, but in spite of their oppressive and inefficient administration. The Zamindars have done little or nothing to improve the condition of the large tracts of country committed to their care; in most cases, the irrigation works in these tracts have been neglected and are in a disgraceful state of disrepair, while the village servants who have been placed under their control have not been maintained in a state of efficiency. The large incomes derived from the estates are squandered away in incessant litigation or dissipation or wild extravagance, and when the tenantry have to suffer the effects of adverse seasons, their landlords, the Zamindars, are neither able nor willing to assist them. In passing orders on Sir H. Montgomery's report, the Government remarked in connection with the estates sequestrated for arrears of peshkash: "Upon a careful consideration of the Commissioner's report, the Most Honorable the Governor in Council can see no ground to believe that if these estates are restored to the possession of the Zamindars, such an alteration in their character and habits, and such an improved system of management, will take place, as will secure justice to the ryot and prosperity to the district. On the contrary, he has the strongest reason to conclude that, even should the peshkash be greatly reduced, the same results now brought to notice would again be manifested on the occurrence of adverse seasons, droughts and other difficulties. With these views, His Lordship in Council concurs generally in the opinion expressed both by the Commissioner and the Board, that it is not advisable to perpetuate the Zamindari system in the Rajahmundry district, and that attention should be immediately and steadily directed to the introduction of a system which shall foster and protect the interests of the ryots themselves, and consequently that when such estates fall into arrears, they should be brought to sale under the provisions of the law and purchased on account of Government." The Court of Directors also, with reference to Mr. Walter Elliot's report on the Guntúr Zamindaris in 1847, observed that it "places it beyond doubt that the Zamindars of Guntúr wasted, in a long continued course of extravagance, litigation and excess, not only those legitimate resources of their esattes which formed the basis of the permanent settlement, and which, as we have stated, were amply sufficient to meet the occasional occurrence of calamitous seasons, but the large additional sums which they are proved to have extorted under various pretences from the ryots." Further on they wrote thus: "In your future arrangements

* G.O., 14th April 1846, No. 432.

† G.O., 29th March 1849, No. 310.

G.O., dated 14th April 1846, No. 432.

G.O., 29th March 1849, No. 310.

connected with these districts, we would impress on you the expediency of a stricter application of the sale law for the recovery of arrears of revenue. The leniency which has hitherto been practised in this respect has subjected the Government to great losses, without, as we believe, any real benefit to the Zamindars who have been thus favored. Its usual effect has been merely to avert for a time the dispossession of the Zamindars, whose estates it has ultimately been found necessary to bring to sale, burdened with increased balances. In all ordinary cases where estates known to be moderately assessed fall into arrears, except perhaps in the instance of some of the Hill Zamindaris, which could not be conveniently managed by our officers, the provisions of the law should be enforced. The practice of pensioning dispossessed Zamindars—a practice almost if not altogether unknown under the Bengal Presidency—must be discontinued, and you should prohibit all interference in arranging the private debts of Zamindars on the part of the officers of Government, whose whole time and attention should be devoted to their proper duties connected with the revenue administration of the country." The Board do not consider that anything has occurred in later years which necessitates a departure from the policy thus laid down by the Court of Directors. There is no reason to suppose that if money-lenders should get possession of portions of Zamindaris, the ryots would fare worse under them than under the present Zamindars. Money-lenders are generally shrewd men of business and quite alive to their interests, and if perhaps less indulgent in the exaction of their dues are likely in their own interest not to allow the affairs of their estates to get into inextricable confusion.

7. Lastly, it is stated that the proposed legislation is necessitated by political considerations. The Board question the existence of any such political necessity. They fail to see what service Zamindars have rendered to Government or to the people that they should be maintained in spite of themselves and their follies, or what danger they can threaten that would make it politic to maintain or to conciliate them. Estates as old, if not older and as great as those of Vizagapatam, have disappeared from the Zamindari rolls of other districts in the Northern Circars, but their disappearance caused no convulsion, and scarcely a regret among the people with whom their proprietors had lived. Mr. Walter Elliot, in connection with the resumption of Zamindaris in Guntúr in 1847, wrote as follows: "My own experience of the sentiments of the people of the district does not confirm the opinion expressed by the Board of Revenue that the assumption of the estates by Government would be generally unpopular. On the contrary, the best and most respectable individuals whom I met with declared their anxiety to be placed under a permanent system of administration that would protect them from the vexatious interference of the renting system, and from the exactions and oppression under which they had so long suffered. As for feelings of attachment to the persons or families of the Zamindars, I could not discover that any such existed beyond the range of their immediate followers." This was written more than thirty-five years ago, and since that time the change that has taken place in the circumstances of the country has had the tendency of weakening rather than strengthening any remnant of feudal feeling which might then have existed. The circumstances of this presidency, in which the Zamindars have for upwards of a century been deprived of military power and civil and criminal jurisdiction, are entirely different in this respect from those of Scinde, Oude, and other provinces of India, which within the memory of the existing generation were governed by petty independent chiefs.

8. The Board are aware that exceptional arrangements may occasionally be found necessary in reference to Hill Zamindaris in the Agency Tracts, but such cases must be dealt with specially as they arise and not form the basis for general legislation. When it is expedient to interfere in the affairs of such Zamindaris, Government can always do so by granting a loan to the Zamindar for the liquidation of his debts and taking a mortgage of the estate, as has been done in the case of the Ramnad Zamindari. In regard to other estates also the Collector can, in exceptional cases, interfere under the provisions of the Code of Civil Procedure relating to the execution of decrees. The Code recognizes a distinction between cases in which the debts sought to be enforced against an estate are specially charged against it and cases where they are not, and in the latter event enables the Collector to intervene to save,

if possible, landed property from being inconsiderately sold for the satisfaction of simple debts. This seems to be the utmost limit to which protective legislation can be carried. Government already do a great deal in an indirect way to enable Zamindars to manage their estates efficiently. In calamitous seasons they suspend the collection of the peshkash, and when estates come under the management of the Court of Wards they endeavor to put their affairs in order and to educate the Zamindars in their duties. If, notwithstanding these advantages, the Zamindars are unable to hold their ground, the Board consider that so far as policy is concerned it is the highest political wisdom to oppose no artificial obstacles to their decay. If special protective legislation is to be undertaken it must rather be in the interests of neglected tenants than in those of wasteful landlords who have abused their position and influence.

9. In conclusion the Board would draw the attention of Government to the suggestion contained in their Proceedings, dated 7th March 1879, No. 618, in regard to the appointment of a Commission to inquire into the neglected condition of irrigation works in Zamindaris, the state of village establishments, &c., and to devise measures to compel Zamindars to perform the duties they owe to their tenantry.

(A true Copy and Extract.)

(Signed) J. A. DAVIES,
Acting Secretary.

To the Chief Secretary to Government, Judicial Department, with Government Reference returned and with copies of Board's Proceedings, 7th March 1879, No. 618, and 2nd April 1883, No. 914.

Copy to the Collector of Vizagapatam.

Endorsement, No. 2011.

Transferred to the Revenue Department.

ORDER—dated 8th January 1884, No. 10, Revenue.

Miscellaneous.

The Government concur in the opinions expressed by the Board of Revenue in the resolution recorded above.

2. The matters referred to in paragraph 9 are now under the consideration of Government and orders will be issued shortly.

(True Extract.)

(Signed) E. S. LAFFAN,
for Secretary to Government.

To the Board of Revenue.
,, the Judicial Department.
,, the Director of Revenue Settlement and Agriculture.
,, the Public Works Department, Irrigation Branch.

Exd. W. H. French.

100 Copies.

Ind No 184/84

Govt. of {1884} Madras.

REVENUE.

No 214/10

Issued

Recd. *Encl.*

mmunicated to the Officers in charge of Settlement Parties.

pt. of Rev. Sett. & Agre.
dras 25 January 1884

(By order)

[signature]
1st. Assistant

The Dy Director of Reve. Settl.
Party No III

G.O., 8th January 1884, No. 10.

JANUARY.

Encumbered Estates Act.

Board's opinion that the proposed extension of the — of other provinces of India to this presidency is not desirable, concurred in.

5

11th January 1884, No. 40, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from W. R. ROBERTSON, Esq., M.R.A.C., Agricultural Reporter to the Government of Madras, to the Director of Revenue Settlement and Agriculture, dated Saidápet, 29th November 1883, No. 2122; and endorsement by W. WILSON, Esq., Director of Revenue Settlement and Agriculture, dated Madras, 4th December 1883:—

In reply to your Proceedings, No. 1653, dated 27th instant, I have the honor to state that Planter's Friend (*Sorghum Kaffrarium*) should be cultivated in the same way as cholum. If it is intended to make jaggery from the juice of the plant, it should be cut down before the seed has fully hardened. The refuse cane, after crushing, and the grain may be used for feeding stock.

2. Broom corn may be cultivated in the same way as cumbu (*Penicillaria spicata*). The plant contains no saccharine juice, but both the straw and grain may be used for feeding. The seed panicles may be used for broom manufacture.

* * * * *

Endorsement, No. 1716A.

Forwarded to all Collectors for information.

To all Collectors.

Submitted to Government for information.

(Signed) W. WILSON,
Dir. of Rev. Settl. and Agriculture.

To the Secretary to Government, Revenue Department.

Order—dated 11th January 1884, No. 40, Revenue.

Miscellaneous.	Recorded.

(True Extract.)

(Signed) E. S. LAFFAN,
for Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

Exd. W. H. French.

70 Copies.

Inc No. 155/84

Govt. of {1884} Madras.

REVENUE.

No 196

...mmunicated to the Officers in charge of Settlement Parties, to ... Agricultural Reporter and to the Inspector of Cattle Disease.

...t. of Rev. Sett. & Agre. }
...dras 25 January 1884 }

(By order)

[signature]
1st. Assistant

...he Dy Director of Rev. Settt
Party No. III

Issued

Recd. Encl.

G.O., 11th January 1884, No. 40.

JANUARY.

Planter's Friend and Broom Corn.

Copy of Mr. Robertson's letter regarding the cultivation of — submitted by the Director of Agriculture, recorded.

28/1/84. C.W.

6

Reg. No 3

11TH JANUARY 1884, No. 41, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to all Collectors, dated Madras, 11th December 1883, No. 1778-A :—

I have the honor, in continuation of this office No. 1252, dated 20th September 1883, and in reference to answers received thereto from Collectors, to enclose for your information two forms, A and B, in which the statistics of cattle-disease may, I think, be conveniently reported to the inspector.

2. The form A is intended for the report of an out-break and has been already communicated to you. The form B is intended for the tabulation of the monthly statistics.

3. I would suggest, for your consideration, whether the monthly statistics could not conveniently be tabulated by the birth and death registration clerks in your office and in the same way as births and deaths are tabulated. All that would be necessary would be to print on the reverse of the village birth and death register the following record :—

Statistics of Cattle-disease.

Date of Occurrence.	Nature of disease.	Date of original out-break.	Kind of animals affected, *i.e.*, cattle, sheep, goats, &c.	Number of Animals.			
				Attacked.	Died.	Recovered.	Remaining.

Submitted to Government for information.

(Signed) E. GIBSON,
Acting Secretary,
for Dir. of Rev. Settl. and Agriculture.

To the Secretary to Government, Revenue Department, with copy of form A.

A.

Report of an out-break of Cattle-disease in District for Week ending 188

1	Name of taluk and village.	
2	Name of disease, Native or English.	
3	Date of out-break of disease.	
4	Number of cattle attacked with the disease.	
5	Number of cattle died from the disease.	
6	Number of cattle recovered from the disease.	
7	Number of cattle remaining now sick.	
8	Number of cattle belonging to the village.	
9	Is the disease infectious?	
10	How supposed to have originated?	
11	Record carefully the following symptoms:—General appearance of coat, condition of skin, stating whether there are any eruptions on it. The general temperature or heat of horns, ears and legs. State whether the nose is moist and cool, or hot and dry. The general appearance of the eye and its membranes. Is the animal dull and sleepy, restless or wakeful? Give the quantity and appearance of the urine, the same of the fæces or dung. If any discharge from the nostrils, discharge of tears from the eyes, or water (saliva) from the mouth. Any cough. The state of the breathing; whether there is any difficulty in swallowing or swelling about the throat or other parts of the body. Shivering fits. Lameness. Sores between the hoofs. Any other symptoms not given above, which may be noticed.	
12	Average duration of attack before recovery or death.	
13	What preventive measures are used?	
14	What medical treatment adopted? and if so, with what result?	

Date

Signature of Reporting Officer.

B.

Statistics of Cattle-disease in the District for the Month of 188 .

Taluk.	Number of villages affected.	Date of outbreak.	Nature of disease.	Kind, *i.e.*, cattle, sheep, goats, &c.	Number of Animals.				Percentage of deaths.	Remarks.
					Attacked.	Died.	Recovered.	Remaining.		

COLLECTOR'S OFFICE,
188 .

Collector.

ORDER—dated 11th January 1884, No. 41, Revenue.

Miscellaneous.	Recorded.

(True Extract.)

(Signed) E. S. LAFFAN,
for Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

Exd. W. H. French.

70 Copies.

Ine No 156/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 11th January 1884, No. 41.

JANUARY.

No 197

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 25 January 1884

(By order)

[signature]
1st. Assistant

To
The Dy Director of Reve. Settt.
Party No. III

Statistics of Cattle-disease.

Copy of letter from the Director of Agriculture to Collectors prescribing forms of —, recorded.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from H. F. CLOGSTOUN, Esq., Accountant-General, to the Secretary to Government, Revenue Department, dated Fort St. George, 12th November 1883, No. 3832:—

With reference to the Proceedings of Government, No. 1102, dated the 11th September 1883, I have the honor to forward letter No. 174-G, dated 20th October 1883, from the Superintendent, Madras Survey, with two statements,* and to state that the entries as regards officers and establishment in the columns of "present scale" and "present strength" in the statements have been compared with the registers of this office and are correct.

* Proposition statement for the whole Survey Department.
Comparative statement showing the present strength of the Nílgiri detachment and the proposed scale for the Malabar survey party.

READ—the following letter from Colonel H. T. ROGERS, R.E., Superintendent, Madras Survey, to the Secretary to Government, Revenue Department, (through the Accountant-General), dated Ootacamund, 20th October 1883, No. 174-G.

With reference to G.O., dated the 11th September 1883, No. 1102, I have the honor, in submitting a proposition statement for the Malabar survey party, to enclose therewith a detailed statement showing the present strength of the Nílgiri detachment, Madras Survey, as compared with the proposed scale for the new party.

ORDER—dated 16th January 1884, No. 63, Revenue.

Land Revenue, No 6.

In G.O., 18th April 1883, No. 459, the Government, after carefully considering the history of the existing Land-revenue Settlement of Malabar and South Canara, recorded their opinion that there was nothing in it to show that the State had pledged itself to maintain the present assessments unaltered, and that the survey, already commenced in the Wynaad, should be extended in due time to Malabar and Canara, to be followed by a revision of the terms of settlement, on such a basis as might hereafter appear expedient. Thereupon the Superintendent, Madras Survey, represented that a great saving of time and money might be effected if the survey of the Malabar district were taken up at once, and with that object recommended the conversion of the existing Nílgiri detachment into a complete survey party. The Government approved* of the proposal and called for a proposition statement which is now submitted with the foregoing letter. The cost of the proposed increase in the existing

* G.O., 12th June 1883, No. 730.

survey establishment amounts to Rs. 36,313-8 per annum, and has the approval of this Government. The sanction of the Government of India will accordingly be sought in the Financial Department for the addition to the superior staff of one Deputy Superintendent, 2nd grade, and two Assistant Superintendents, one of the 1st and the other of the 2nd grade. It is observed that provision has already been made for this increased charge in the budget for the ensuing official year.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Financial Department.
" the Superintendent, Madras Survey.
" the Accountant-General, with a proposition statement
" the Board of Revenue.
" the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

100 Copies.

In No 176/84

Govt. of (1884) Madras.

REVENUE.

No 213
9

...mmunicated to the Officers in charge of Settlement Parties.

...pt. of Rev. Sett. & Agre.
...adras 25 January 1884

(By order)

Seeparah
1st. Assistant

To
The Dy Director of Rev. settt
Party No III

Issued

Recd. *Encl.*

G.O., 16th January 1884, No. 63.

JANUARY.

Survey of Malabar.

Proposition statement for the —, approved; and application ordered to be made in the Financial Department for the sanction of the Government of India for the proposed increase in the existing survey establishment.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from the Government of Bombay, to Her Majesty's Secretary of State for India, dated Bombay Castle, 19th June 1883, No. 10:—

We have the honor to advise your Lordship of the despatch of a parcel containing 3 lb. 6 oz. of India-rubber obtained from the plant of the *Cryptostegia grandiflora* in the municipal gardens at Karachi, Sind, and to request that your Lordship will be pleased to direct that the rubber be sent to the India-rubber, Gutta Percha, and Telegraph Works Company (Limited), for opinion regarding its commercial value.

2. The report of the Company named above on the *Ceara* rubber of Ceylon, communicated to the Government of India with the despatch from your Lordship's predecessor, No. 48, dated 10th August 1882, has been recently forwarded to us by that Government for information, and we think it desirable that for the purpose of comparison the value of the rubber now forwarded should also be estimated by that Company.

READ—the following letter from J. MONTEATH, Esq., Acting Under-Secretary to the Government of Bombay, Revenue Department, to the Secretary to the Government of India, Home Department, dated Bombay, 27th November 1883, No. 8699:—

As requested in Mr. Officiating Under-Secretary Forbes' letter No. 817F., dated the 25th ultimo, I am directed to forward herewith a printed copy of the enclosures of the despatch from Her Majesty's Secretary of State for India, to the address of this Government, No. 34 (Revenue), dated the 27th September 1883, on the subject of the commercial value of the sample of India-rubber obtained from the *Cryptostegia grandiflora* plant in the municipal gardens at Karachi.

ENCLOSURES.

Letter from the India-rubber, Gutta Percha, and Telegraph Works Company (Limited), to the Under-Secretary of State for India, dated Silvertown, Essex, London E., 30th August 1883.

In reply to your favor of 20th August (Revenue, Statistics and Commerce, No. 1697), enclosed, we beg to hand you our chemist's report on the sample of India-rubber obtained from the *Cryptostegia grandiflora* plant at Karachi, by which you will see that this rubber is not so good as the *Ceara* rubber of Ceylon. Notwithstanding this it is a fair working quality, and will come in for a good many purposes, and we estimate its present commercial value at about two-thirds to two-sixths per lb.

Report of examination of India-rubber by T. P. BRUCE WARREN, Esq., Analytical Chemist to the India-rubber, Gutta Percha, and Telegraph Works Company (Limited), dated Silvertown, 29th August 1883.

The sample herein referred to was enclosed in a cloth-wrapper. The weight of rubber when received was 3 lb. 5½ oz. nett. Some portions of it had become very sticky and much blackened by oxidation ; a very small portion only had retained the light color of *Ceara* rubber. The whole had become agglomerated by the adhesiveness of the little separate masses of which the sample was composed.

The sample was carefully torn to pieces and examined, a separate examination being made of the lighter and darker portions. The only difference found is in the much larger quantity of moisture met with in the lighter portions.

The sample differed considerably from the two samples of *Ceara* rubber received last year from Ceylon and reported on to W. T. Thiselton Dyer, Esq., 29th June 1882.

The Ceylon sample No. 1 was firm and free from stickiness when received, and has remained almost unaltered up to the time of writing this report, whilst sample No. 2 has become strongly resinified by oxidation. These were both light in color when received, and have remained so.

Even the lightest portions of the sample forming the subject of this report are much darker in color than either of the samples examined in June 1882 and referred to above.

This of itself is not a matter of much importance, but taken as an indication of its unalterability may be of some significance when the collection is made on a large scale.

The stickiness of the present sample renders it problematical how far it would be able to compete with the sample No. 1 collected in Ceylon.

It might have been possible to have given some assurance on this point if the time was stated how long this sample had been collected. In its present condition it is hardly equal to *Ceara* rubber from Brazil, although its general qualities are very encouraging.

Digested in alcohol both the lighter and dark portions gave up a considerable quantity of soluble matter, the darker kind became partly whitened, the greater portion being unaffected in this respect.

On washing and drying, the lighter portions lost 15·6 per cent., the darker portions lost only 2·9 per cent. The amount of ash obtained from the lighter portions was before washing 4·3 per cent., after washing 2·7 per cent. The darker portions yield before washing 4·2 per cent., after washing 2·3 per cent.

Mixed with the suitable proportion of sulphur and heated both portions vulcanized remarkably well. It might have been expected that the least oxidized portions would have yielded a tougher and harder product when vulcanized, as compared with the darker portions, but in this respect no difference could be perceived.

No. 904F. (Forests), dated Calcutta, the 6th December 1883.

Endorsed by the HOME DEPARTMENT.

Copy forwarded to the Revenue and Agricultural Department for information, in continuation of the correspondence ending with the endorsement from that department, No. 597—53-5 (Agriculture), dated the 29th June last.

Circular, No. 95A.

Copy forwarded to the Local Governments and Administrations noted in the margin, for information, with reference to the previous correspondence ending with circular No. 15A., dated 28th February 1883.

Madras.	Punjab.
Bengal.	British Burma.
North-Western Provinces and Oudh.	Central Provinces.
	Assam.

(By Order)

REV. AND AGRI. DEPT. (AGRICULTURE), Calcutta, 22nd December 1883.

(Signed) T. W. HOLDERNESS, Under-Secy. to the Govt. of India.

To the Secretary to the Government of Madras.

12

ORDER—dated 11th January 1884, No. 44, Revenue.

Miscellaneous.

Communicated to the Board of Revenue, the Director of Revenue Settlement and Agriculture, and the Director of Government Cinchona Plantations, Botanical Gardens and Parks, Nílgiris.

(True Extract.)

(Signed) E. S. LAFFAN,
for Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Director, Government Cinchona Plantations, Parks and Gardens, Nílgiris.

Exd. W. H. French.

70 Copies.

In No. 210/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

No 300

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 6th February 1884

(By order)

[signature]

1st. Assistant

To

The Dy. Director of Revue Settt.
Party No. III

G.O., 11th January 1884, No. 44.

JANUARY.

India-rubber Trees.

Papers from the Government of India on the subject of — grown at Karachi, communicated to certain authorities.

13

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—again G.O., dated 16th March 1881, No. 453, Revenue :—

Abstract.—Passing orders on Revenue Board's proceedings submitting letter from Commissioner recording his opinion as to the way in which the settlement of lands on the Nílgiris should be conducted.

Order—dated 18th January 1884, No. 86, Revenue.

Land Revenue, No. 11.

In consequence of the small amount of available waste remaining in the settlements of Ootacamund, Coonoor and Wellington, and in view of the probable requirements of Government, the Right Honorable the Governor in Council is pleased to direct that Rules X and XVI of the Settlement Rules for the Nílgiri Hills shall be held inapplicable to the settlements above named, save in cases in which applications for settlement grants had been already registered, and that in the latter cases no grant exceeding 10 acres shall in any case be allowed, and none without special reference to the Collector. He further directs that no applications for the sale of such land under the Waste Land Rules within the said settlements shall be entertained without the previous sanction of Government obtained on a special recommendation of the Collector in the first instance.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.
,, the Collector of Nílgiris.

Exd. W. H. French.

70 Copies.

Jn No 189/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 18th January 1884, No. 86.

JANUARY.

Rules for the Settlement of Lands on the Nilgiri Hills.

Sanctioning, with remarks, the relaxation of Rules X and XVI, and issuing instructions in regard to the disposal of applications for grants of waste lands in the settlements of Ootacamund, Coonoor and Wellington.

No 191/10

x x x

... Copy also to the officers ... charge of other Parties

Dept of Revc. Settt & Agriculture (By order)

Madras 23rd January 1884
Desd 7 Feb.

[signature]
1st Assistant

To
the Dy. Director of Revc. Settt.
Party No. III

PRELIMINARY ISSUE.

14

PRODUCTIVE PUBLIC WORKS, IRRIGATION AND NAVIGATION.

MADRAS PRESIDENCY.

PUBLIC WORKS DEPARTMENT.

IMPERIAL BUDGET ESTIMATE

OF

PRODUCTIVE PUBLIC WORKS, IRRIGATION AND NAVIGATION,

IN THE

MADRAS PRESIDENCY,

FOR THE YEAR

1884-85.

January 1884.

(Signed) J. O. HASTED, Colonel, R.E.,
Ag. Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

2nd August 1884, No. 897, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from T. W. HOLDERNESS, Esq., C.S., Under-Secretary to the Government of India, Revenue and Agricultural Department (Statistics), to the Secretary to the Government of Madras, Revenue Department, dated Simla, 5th July 1884, No. 179 Stats. :—

In reply to the inquiry contained in the second paragraph of your letter, No. 583, of the 2nd May last, on the subject of road-traffic registration for public works purposes, I am directed to state that the Government of India have no objection to the debit against the Provincial Budget under the head "Public Works, Railways," of such portion of the charges for temporary establishments entertained in connection with the registration of road-traffic as the Government of Madras in the use of its discretion deems equitable. All charges of this nature are, I am to add, properly chargeable to provincial revenues.

Order—dated 2nd August 1884, No. 897, Revenue.

Miscellaneous.

The Government consider that the whole cost of the establishments entertained for collecting statistics of traffic required for railway projects should be charged against "Public Works, Railways."

2. These Proceedings will be communicated to the Board of Revenue and the Public Works Department, Railway Branch, with reference to G.O., dated 21st June 1884, No. 776. The Board will report what provision is required to meet the charge for the current year.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
" Public Works Department, Railway Branch.
" Director of Revenue Settlement and Agriculture.

Exd. A. F. Aaron.

...pies.

Inw No 2116/84

Govt. of (1884) Madras.

REVENUE

Issued

Recd. Encl.

No. 1624

Communicated to the Officers in charge of Settlement Parties, to Agricultural Reporter and to the Inspector of Cattle diseases.

Dept. of Rev. Sett. & Agre.
Madras 16th August 1884

(By order)

[signature]
1st. Assistant

The Dy: Director
Party No III

G.O., 2nd August 1884, No. 897.

AUGUST.

Road Traffic.

Registration of — for public works purposes. Letter from the Government of India on the subject of the debit of the cost of —, communicated to the Board of Revenue and the Public Works Department, with the intimation that the whole cost should be charged against P[illegible] Works, Railways; and the former d[illegible] report what provision is required [illegible] charge for the current year.

Inw No. 2341/84

Govt. of (1884) Madras.

REVENUE. 16

No. 2603 / 148

Issued

Recd. Encl.

mmunicated to the Officers in charge of Settlement Parties.

...t. of Rev. Sett. & Agre.
...dras 15th Augest 1884

(By order)

[signature]
1st. Assistant

The Dy: Director
Party No. III

G.O., 28th July 1884, No. 889.

JULY.

Travelling Allowance.

Directing that the Government of India be addressed in the Financial Department regarding the rate of — to be granted to the two Assistant Directors recently appointed, and recording the opinion of Government on the subject.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from H. F. CLOGSTOUN, Esq., Accountant-General, to the Secretary to Government, Revenue Department, dated Fort St. George, 7th July 1884, No. 2143:—

I have the honor to submit the question raised by the Deputy Director of Revenue Settlement, No. I Party, regarding the rate of travelling allowance to which the two Assistant Directors of Revenue Settlement recently appointed are entitled.

2. It was proposed in Madras G.O., No. 1284, Revenue Department, dated 20th November 1882, that the Assistant Directors should receive travelling allowance at Rs. 3 a-day, but in Government of India letter recorded in Madras G.O., No. 1296, Revenue Department, dated 17th October 1883, it was stated that the Assistant Directors would be entitled to travelling allowance at the ordinary rates prescribed for officers of their class.

3. As the pay of the Assistant Directors has been fixed at Rs. 425 per mensem, rising, after two years' approved service, to Rs. 550 per mensem, they rank, under Section 4 (*a*) of the Civil Travelling Allowance Code, as first-class officers and are entitled to a daily allowance of Rs. 5 unless included in Schedule F.

4. Assistant Superintendents of the sister department of Revenue Survey, whose pay varies, according to grade, from Rs. 425 to Rs. 900, are restricted (*vide Item* No. 65, Schedule F) to travelling allowance at Rs. 4 a-day although they are first-class officers under Section 4 and Schedule A.

5. In these circumstances, I am doubtful regarding the rate of travelling allowance to be passed to Assistant Directors, and have deemed it proper to submit the question, through the Madras Government, for the orders of the Government of India.

6. I would observe that in Item No. 75, Schedule D of the Civil Travelling Allowance Code, Assistant Directors, Revenue Settlement, Madras, are entitled to a permanent monthly travelling allowance of Rs. 75, the rate fixed for the grade of Assistant Director when the department was originally organized. When this entry was inserted, the appointments in question had lapsed and the ruling in the Government of India letter above referred to did not exist.

ORDER—dated 28th July 1884, No. 889, Revenue.

Miscellaneous.

The Government of India will be addressed in the Financial Department.

2. The Government are of opinion that Assistant Directors of Revenue Settlement should draw the same travelling allowances as Assistant Superintendents of Survey. The rate, Rs. 3 per diem, originally

proposed to the Government of India will not suffice when the Assistant Directors are placed, as they may be, in charge of detachments of a party.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Financial Department.
,, Accountant-General.
,, Board of Revenue.
,, Director of Revenue Settlement and Agriculture.

Exd. J. W. Fischer.

80 copies.

22.8.92

27

18

28TH JULY 1884, No. 1703, FINANCIAL.

GOVERNMENT OF MADRAS.

FINANCIAL DEPARTMENT.

READ—the following paper:—

From M.R.Ry. P. CHENTSAL RAO, Superintendent of Stationery, to the Chief Secretary to Government, dated Madras, 8th July 1884, No. 467.

I have the honor to submit my report on the working and results of the Stationery department during the year 1883-84, with the usual statements A to E.

2. The subjoined statement shows the value of the stock at the beginning of the year, that received and issued during the year, and the balance:—

	1882-83.	1883-84.
	RS.	RS.
Value of the stock at the beginning of the year ..	7,57,607	4,66,716
Do. of the articles received during the year ..	1,31,437	4,43,546
Total ..	8,89,044	9,10,262
Value of the articles issued during the year	4,22,328	5,24,680
Balance ..	4,66,716	3,85,582

3. *Receipts.*—The particulars of receipts are given below:—

	1882-83.	1883-84.
	RS.	RS.
1. Value of articles obtained by indent on the Secretary of State	9,061	2,76,277
2. Value of articles obtained by indent from Messrs. Baker and Co., London	1,381	11,274
3. Value of Europe articles purchased locally ..	16,423	2,134
4. Value of French Foolscap paper purchased locally under G.O., dated 20th August 1881, No. 1523, Financial department	59,412	61,795
5. Value of country articles purchased locally ..	36,945	48,661
6. Do. of articles obtained from the Superintendent of Stationery, Calcutta	..	6,300
7. Value of articles obtained from the Superintendent of Stationery, Bombay	41	..
8. Value of articles obtained from the Gun Carriage Factory, Madras	1,602	1,469
9. Value of articles obtained from other departments.	1,689	2,578
10. Do. of articles returned from officers	4,235	4,946
11. Do. of articles issued in excess of the balance shown in the accounts and therefore entered under receipts to square the account	648	1,005
12. Value of excess discovered in stock-taking (*vide* G.O., dated 20th September 1883, No. 2097, Financial department)	..	6,948
13. Adjustments on account of the difference between the rates of prices adopted for issues and receipts respectively	..	20,153
14. Adjustments made with reference to the Auditor's report for 1881-82	..	6
Total ..	1,31,437	4,43,546

Items 1 *and* 2.—The articles indented for 1882-83 instead of being received during that year were received in 1883-84. Hence the increase, which would have been still greater, had *all* the articles indented for 1883-84 been received during that year.

Item 3.—The practice of purchasing European articles in the local market has been discontinued; the few articles purchased in 1883-84 were those urgently required pending the receipt of the supplies from England.

Item 4.—The quantity of paper which ought to have been supplied at the close of 1882-83 was supplied by the contractors in 1883-84. Hence the increase.

Item 5.—The increase is due to the purchase of articles required for 1884-85. As will be seen further on, a considerable portion of the supplies required for 1884-85 were issued at the close of 1883-84.

Item 6.—2,100 reams of printing double foolscap, 16 lb., valued at Rs. 6,300, were obtained from the Superintendent of Stationery, Calcutta, to meet the urgent demands of the Superintendent, Government Press, and the Collector of Salem.

Item 13.—I have explained the nature of this item in my last administration report. The large amount entered under this item is mainly due to the difference in the prices adopted for the articles noted below under issues and receipts respectively:—

Articles.	Price adopted for issues.			Price adopted for receipts.			
	RS.	A.	P.	RS.	A.	P.	
Paper, Section, Royal $\frac{1}{5}$th	8	13	4	3	6	11	per quire.
Do. do. $\frac{1}{10}$th	11	7	11	4	2	2	,,
Do. do. $\frac{1}{20}$th	12	0	5	3	5	2	,,
Do. Medium $\frac{1}{10}$th	8	0	10	2	11	2	,,
Do. do. $\frac{1}{20}$th	10	1	6	3	1	6	,,
Do. Demy $\frac{1}{5}$th	9	13	2	3	0	7	,,
Paper, Writing, Imperial, machine-made	41	1	2	31	8	11	per ream.
Do. Medium, do. ..	18	14	9	14	14	6	,,
Do. Demy, do. ..	13	8	10	10	7	5	,,
Do. Foolscap, hand-made ..	12	14	4	9	6	4	,,
Paper, printing, Medium, 25 lb. ..	5	2	4	4	10	11	,,
Do. do. 16 lb. ..	3	12	0	3	0	7	,,
Do. Demy, 17 lb. ..	3	12	11	3	3	6	,,
Do. Double Pott, 14 lb. ..	3	4	9	2	7	7	,,
Do. Double Foolscap, 28 lb.. .	5	6	11	4	14	8	,,
Paper, drawing, albumnized	5	5	7	4	5	8	per quire.
Colors, spare, Prussian blue	0	10	2	0	8	3	per cake.
Do. cobalt	1	4	8	1	3	1	,,
Lamp-black, best quality	0	5	6	0	3	3	per lb.
Gum Arabic	0	7	6	0	6	11	,,
Snake stone	0	5	5	0	4	11	,,
Ink-powder, fuchsine	0	11	6	0	5	2	per ounce.
Ink-glasses	2	14	6	1	13	0	per dozen.
Pencils, black-lead	0	7	8	0	3	9	,,
Do. red-lead	1	0	11	0	7	2	,,
Do. blue-lead	0	15	1	0	10	11	,,
Steel-pens, medium	0	9	9	0	9	8½	per gross.
Do. fine	0	9	9	0	9	8½	,,
Rubber, valcanized, ink eraser	0	4	4	0	2	3	per No.
Cards, large	0	6	11	0	2	6½	per pack.
Envelopes, medium	0	10	10	0	10	2	per cent.
Irish 4th Reading Lesson Book.. ..	0	5	2	0	5	1⅓	per No.

The other items do not call for remark.

4. *Issues.*—The figures under this head show an increase of Rs. 1,02,352 as shown below:—

	RS.
1882-83	4,22,328
1883-84	5,24,680
Increase ..	1,02,352

The details are as follow :—

	1882-83. RS.	1883-84. RS.
1. Value of articles supplied to Public offices free of payment	4,04,000	4,89,564
2. Value of articles supplied to Public offices on receipt of payment	15,395	10,247
3. Value of deficiency discovered in stock-taking (*vide* G.O., dated 20th September 1883, No. 2097, Financial department)	..	8,842
4. Value of obsolete and damaged articles sold at public auction	2,880	12,240
5. Adjustments on account of the difference between the rates of prices adopted for issues and receipts respectively	..	661
6. Value of service books of the old form destroyed.	..	149
7. Value of articles supplied to the Controller of Military Accounts, Poona	..	121
8. Value of surplus articles sent to the Superintendent of Stationery, Calcutta	..	2,506
9. Value of surplus articles sent to the Superintendent of Marine Survey to the Government of India. .	22	..
10. Value of surplus articles supplied to the Superintendent of Public Works Stores	..	278
11. Miscellaneous items	31	72
Total ..	4,22,328	5,24,680

Item 1.—Excepting in the case of hospitals, it was not usual to issue in one year articles required for another year, but in view to avoiding complaints of delay, the Acting Superintendent, during my absence on leave, despatched towards the close of 1883-84 a considerable portion of the stationery required for 1884-85. The value of the increased quantity so despatched in advance is Rs. 57,000. This accounts for a large portion of the increase. The remainder is due to the larger quantities indented for State Railways and Post offices, owing, I believe, to the extension of their work, and to the larger supplies to other departments in consequence of a diminished supply in 1882-83 for want of sufficient stock in hand.

Item 4.—The amount entered against this item is the value of the damaged articles received from districts and of those sold with reference to the orders marginally noted.

G.O., Military department, No. 6140, dated 19th November 1881.
G.O., Military department, No. 6367, dated 24th November 1882.
G.O., Financial department, No. 2097, dated 20th September 1883.

Item 5.—This item is of the same nature as that of No. 13 under receipts. When the rates of prices adopted for issues are higher than those adopted for receipts, the difference is shown under receipts, when less, under issues or disbursements.

The other items are self-explanatory, and do not call for remark.

5. *Stock on hand at the end of the year.*—The stock on the whole is less than the requirements of a year. Considerable difficulty and inconvenience were experienced for want of sufficient stock of country articles, but the G.O., Financial department, dated 25th April 1884, Mis. No. 906, which has sanctioned the purchase of an adequate stock will obviate the inconvenience in future. There are some articles which are in excess of the requirements for 3 years. I am trying to dispose of them as soon as possible, and I shall not, of course, indent for further quantities till the stock on hand is used up or otherwise disposed of.

6. *Expenditure of stationery in each office.*—I have not been able to maintain a register of actual expenditure of each article of stationery in each office. I shall open it when the additional establishment applied for is sanctioned. I trust that it will be of much use in checking extravagance in the use of stationery.

7. *Substitution of the country for European articles.*—The Indian articles substituted for those formerly obtained from England are noted below :—

Europe articles discontinued.	Country articles substituted.	Value of country articles purchased.	
		1882-83.	1883-84.
		RS.	RS.
Ink bottles, delf	Ink bottles, delf-glazed, manufactured at the Madras School of Arts.	..	104
Ink wells	Ink wells, manufactured at the Madras School of Arts.	..	174
Ink-powder, black	Ink powder, black, manufactured locally.	742	1,147
Ink, printing, black	Amrital-ul-Roy's Printing ink manufactured at Calcutta.	..	663
Ink, Morell's registration, black.	David Waldie's black registration ink, manufactured at Calcutta.	..	491
Penknives	Penknives manufactured by Mr. Johnstone, Mamully, Beypore.	..	203
	Total ..	742	2,782

The saving effected by the purchase of all these articles in 1883-84 is estimated at Rs. 1,210. A few more country articles, shown as below, have also been ordered to be substituted for those received from England, but they were not purchased during the year owing to the existence of sufficient stock in hand. Every endeavour is being made to substitute as many Indian manufactured articles as possible for similar articles of European manufacture :—

European articles discontinued.	Country articles substituted.
Printing Royal, thick, 28 lb.	Bally Mills, Badami Royal, 25 lb., manufactured at Calcutta.
Imperial Cap	Bally Mills Brown Cartridge, super Royal, 40 lb., manufactured at Calcutta.
White Cartridge, Royal, 40 lb.	Bally paper, No. 31, manufactured at Calcutta.
Do. do. 35 lb.	Do. No. 13, do.
Printing Royal, yellow, 25 lb.	Bally Mills, Badami Royal, yellow, 20 lb., manufactured at Calcutta.
Mill-boards	Articles manufactured by Messrs. Bassak and Co., Calcutta.
Color saucers and slabs	Articles manufactured at the Madras School of Arts.
Postage scales with weights	Articles manufactured by Shunkaralinga Auchari, Dindigul.
Paste-boards	No suitable substitutes have been yet fixed.
Grass mill-boards	
Erasers	
Scissors	
Penholders	
Press blanket	
Ivory folders	
Long cloth	

8. *Supplemental Indents.*—The number received is shown below. I am satisfied that they were all necessary :—

	Number.
1882-83	187
1883-84	180

9. *Check over the Indents.*—There has been no material alteration in this respect.

10. *Changes in the articles of stationery.*—The changes referred to in your letter to the Government of India, No. 1600, dated 26th July 1883, Financial department, will be carried out from 1885-86.

11. *Cash receipts and charges.*—The subjoined statement shows the cash receipts and charges :—

RECEIPTS.

Items.	1882-83.	1883-84.
	RS.	RS.
1. Sale-proceeds of stationery .. } 2. Commission realized on the above. }	18,856	9,216 / 337
3. Sale-proceeds of service books ..	272	1,492
4. Do. of waste paper ..	1,789	2,242
5. Do. of packing materials	783	1,211
6. Obsolete and damaged articles sold by public auction.	296	747
7. Fines imposed on contractors ..	46	..
8. Gain realized by sale of service books and stationery.	4	..
9. Deposits forfeited by contractors..	150	..
10. Received from contractors on account of the higher price paid on articles purchased in the local market in consequence of their default in supplying the articles according to the terms of the contract.	103	..
11. Railway charges recovered from officers to whom stationery was supplied on payment.	111	82
12. Sundry receipts	10	4
13. Part payment made by the store-keeper on account of the deficiency discovered in stock-taking.	..	40
Total cash receipts ..	22,420	15,371
14. Deduct the amount as per Auditor's report recorded in G.O., dated 15th March 1883, No. 600, Financial department.	97	..
	22,323	15,371
15. Receipts by adjustment on account of supplies made to the Superintendent of Public Works Stores.	..	278
Total ..	22,323	15,649

DISBURSEMENTS.

Items.	1882-83.	1883-84.
	RS.	RS.
1. Purchase of stationery ..	1,04,103	1,19,423
2. Service labels and telegraph message labels.	218	265
3. Conveyance of stationery ..	4,548	7,803
4. Packing and despatching charges.	1,175	1,982
5. Boat hire and pier toll charges	152	756
6. Freight paid in India on account of stationery stores received from Secretary of State.	499	914
7. Freight paid in India on account of stationery stores sent to out-stations.	1,536	1,360
8. Godown rent	1,046	870
9. Office contingencies	400	475
10. Permanent office establishment	7,471	7,459
11. Honorarium for taking stock of stationery stores	..	150
Total cash payments ..	1,21,184	1,41,457
12. Charges by adjustment on account of supplies received from the Gun Carriage Factory.	1,602	1,319
13. Charges for repairing a pair of scales by the Superintendent, Public Works Stores.	20	..
Total ..	1,22,806	1,42,776

The value of stationery purchased shown in the above statement differs from the value of stationery brought to account as shown in paragraph 3 *supra* by Rs. 6,833. The following figures explain the difference :—

		RS.
Value of stationery brought to account in 1883-84 as shown in paragraph 3 *supra* A (2,134 + 61,795 + 48,661)		1,12,590
Deduct the amount paid by the Controller of Military Accounts in 1883-84	2,005	
Deduct the amount paid in 1884-85 on account of articles brought to account in 1883-84	2,128	
		4,133
Remainder ..		1,08,457
Add value paid in 1883-84 on account of articles brought to account in 1882-83	9,639	
Add value paid to the Superintendent, Government Press, for the materials purchased by him on account of binding service books	1,327	
		10,966
Total given in the above statement B ..		1,19,423
Difference between A and B ..		6,833

The value of stationery sold is given in paragraph 4 as Rs. 10,247, whereas the proceeds of the stationery sold is given in the above statement as Rs. 10,708 (9,216+1,492). The following figures explain the difference :—

	RS.	RS.
Value of stationery and service books sold as shown in paragraph 4		10,247
Deduct—		
Value received and adjusted in 1882-83 for articles supplied in 1883-84	239	
Value received and adjusted in 1884-85 for articles supplied in 1883-84	465	
Value of service books supplied in lieu of those of the old and new forms returned from officers	20	
		724
		9,523
Add—		
Value received and adjusted in 1883-84 for articles supplied in 1882-83	45	
Value received and adjusted in 1883-84 for articles supplied in 1884-85	344	
Value received and adjusted in 1883-84 for articles to be supplied hereafter	255	
Value of service books and stationery sold by Collectors and other officers	458	
Increase obtained by adopting the rates of 1881-82 in valuing sale indents before the rates of 1882-83 were ready	83	
		1,185
Total		10,708

The value of supplies made by the Gun Carriage Factory at the close of the year is adjusted in the accounts in the following year. Hence the difference between the amount adjusted and the value of the articles actually received.

12. *State of building.*—Improvements to the Stationery office have been sanctioned* and the work is under progress.

* G.O., dated 14th March 1884, No. 695 W., Public Works.

ENCLOSURES.

STATEM. 'NT A.

	RS.	A.	P.	RS.	A.	P.
Balance on the 1st April 1883				4,66,715	13	6
Receipts.						
From the Secretary of State for India	2,76,276	10	5			
By local purchase of Europe articles	2,133	14	4			
From the Superintendent of Stationery, Calcutta	6,300	0	0			
From Messrs. Baker and Co., London	11,274	7	11			
By ordinary local purchases	1,10,455	11	4			
From the Gun Carriage Factory, Madras	1,469	3	1			
From other offices	7,524	2	10			
Found surplus	1,004	14	10			
As per auditor's report on the accounts for 1881-82	5	10	1			
Excess discovered in stock-taking	6,948	1	8			
Adjustment on account of variation in rates	20,153	2	2			
				4,43,545	14	8
Total				9,10,261	12	2
Issues.						
Sales	10,246	8	11			
Obsolete articles sold by auction	11,209	0	6			
Damaged do. do.	1,031	0	6			

Issues.	RS. A. P.	
Articles issued as samples	62 0 10	
Amount written off the accounts, being the value of Europe twine found less by weighing without cover the quantity received from the Arsenal	5 14 11	
Amount written off the accounts, being the value of black registration ink-bottles found broken in the consignment received from D. Waldie, Calcutta ..	1 9 5	
Adjustment on account of variation in rates.	661 3 2	
Value of service books of the old form destroyed and written off the accounts ..	149 4 0	
As per auditor's report for 1881-82 ..	2 3 9	
Deficiency discovered in stock-taking ..	8,841 9 9	
Issued to the Supdt. of Stationery, Calcutta	2,505 15 10	
Issued to the Controller of Military Accounts, Poona	121 5 8	
Issued to the Postal, Telegraph, and State Railways	11,523 3 6	
Issued to the other public offices	4,78,318 7 4	
		5,24,679 8 1
Balance on the 31st March 1884 ..		3,85,582 4 1

FORM B.

Articles.	Abstract of receipts for the year 1883-84. From Europe. India office.	From Europe. Messrs. Baker and Co.	By purchase in India.	From the Gun Carriage Factory.	Returned into Stores by officers, &c.	Total.	Abstract of issues to public officers, &c.	Balance.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Paper, drawing	6	28	51	..	129	214	6,106	25,463
,, section	442	70	..	..	1,342	1,854	1,784	803
,, lithographic	..	..	..	..	86	86	3,821	72,242
,, writing	68,833	719	202	..	10,519	80,273	1,09,441	85,828
,, printing	1,83,320	..	20	..	19,254	2,02,594	2,06,897	63,475
,, water-marked	..	..	..	..	50	50	1,039	4,585
,, blotting and marble ..	202	113	..	..	18	333	3,242	1,399
,, country manufactured and French	..	..	85,573	..	764	86,337	97,600	61,972
Bibles and prayer books	..	..	261	..	218	479	709	4,579
Books, levelling, &c.	18	..	..	..	297	315	1,793	541
,, blank, leather-bound and marble-covered	..	..	2,304	..	297	2,601	3,765	1,765
Colors and drawing materials ..	50	71	136	..	376	633	3,557	3,189
Cloth, tracing	450	..	..	..	..	450	3,681	38
,, waxed, &c.	727	..	3,890	..	46	4,663	4,112	1,074
Hones and strops	504	..	..	..	4	508	279	457
Ink bottles and stands	324	..	131	979	169	1,603	2,557	1,526
,, powders, &c.	1,846	..	2,841	..	848	5,535	6,069	1,598
,, printing	889	..	663	..	904	2,456	2,565	4,093
Maps and sheets of Indian Atlas ..	..	..	..	..	17	17	447	12,544
Parchment	677	..	..	..	..	677	318	550
Paste-boards, &c.	168	39	1,918	..	80	2,205	2,102	1,059
Penknives	851	..	203	..	13	1,067	1,100	110
Pencils	2,066	271	305	..	2,286	4,928	5,471	1,517
Quills	7,884	..	..	..	8	7,892	15,488	2,071
Rubber	1,639	35	12	..	147	1,833	2,362	1,094
Steel-pens and penholders ..	1,755	4	..	..	92	1,851	2,526	979
Slates	..	..	..	..	2	2	189	631
Sponges	2,030	..	..	..	88	2,118	1,660	2,806
Scissors	..	..	..	..	9	9	859	1,330
Sealing-wax	2	..	3,935	..	17	3,954	3,653	455
Tape, twine, and thread	609	..	5,812	..	743	7,164	6,961	1,159
Vellum	859	..	..	..	..	859	356	510
Wafers	33	..	..	..	..	33	42	70
Miscellaneous	93	32	2,321	490	2,888	5,824	5,295	4,599
School books and materials ..	..	9,892	2,012	..	225	12,129	16,834	19,471
Total ..	2,76,277	11,274	1,12,590	1,469	41,936	4,43,546	5,24,680	3,85,582

FORM C.

ABSTRACT of receipts and issues for each of five years.

Articles.	Receipts.					Issues.				
	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Paper, drawing	18,872	10,317	10,135	376	2,068	6,864	9,491	3,580	3,844	7,890
,, lithographic ..	24,439	59,949	146	..	86	24,788	9,126	2,344	1,387	3,821
,, writing	1,31,463	1,63,029	1,02,002	18,190	80,273	86,396	1,08,700	59,462	99,614	1,09,441
,, printing	2,51,796	93,005	1,31,870	3,233	2,02,594	1,47,815	1,11,802	91,284	1,73,802	2,06,897
,, water-marked ..	3,565	2,648	1,125	..	50	783	1,348	1,633	425	1,039
,, blotting and marble.	4,945	2,883	729	2,255	333	2,025	1,983	1,578	3,193	3,242
,, country manufactured and French.	76,357	84,352	1,01,996	75,009	86,337	1,00,392	88,217	64,105	75,081	97,600
Bible and prayer books ..	154	16	908	108	479	826	81	1,397	1,280	709
Books, levelling, &c. ..	1,222	495	131	337	315	682	621	661	1,150	1,793
,, blank, leather-bound and marble-covered.	2,274	2,143	813	1,700	2,601	544	611	2,856	709	3,765
Colors and drawing materials.	2,979	558	128	316	633	920	2,156	767	3,700	3,557
Cloth, tracing	3,495	2,284	1,348	48	450	1,389	1,463	528	1,139	3,681
,, waxed, &c. ..	3,688	3,850	2,268	3,300	4,663	3,574	3,553	2,442	3,040	4,112
Hones and strops ..	297	382	..	244	508	291	289	152	296	279
Ink bottles and stands ..	1,967	1,587	3,002	1,671	1,603	1,436	1,291	1,955	1,561	2,557
,, powders, &c.	3,630	4,046	729	785	5,535	2,447	1,461	1,723	3,664	6,069
,, printing	10,626	3,620	1,643	1,242	2,456	7,659	2,624	1,907	3,248	2,565
Maps and sheets of Indian Atlas.	125	12	..	2	17	36	182	73	177	447
Mathematical instruments.	396	2	..	..	..	26	1,320	..	..	..
Parchment	476	362	180	..	677	383	221	186	190	318
Paste-boards, &c.	2,939	3,988	3,306	7,033	2,205	4,513	2,850	1,291	11,002	2,102
Penknives	805	1,238	66	418	1,067	483	704	751	962	1,100
Pencils	3,237	6,275	2,591	510	4,928	3,119	2,213	3,461	3,938	5,471
Quills	9,689	21,051	10,726	5	7,892	10,834	8,263	6,866	3,894	15,488
Rubber	1,069	1,682	1,016	25	1,833	942	831	756	1,151	2,362
Steel-pens and penholders.	1,930	2,428	1,425	247	1,851	1,730	1,154	1,440	1,715	2,526
Slates	374	181	122	1	2	176	[illegible]	227	110	189
Sponges	2,535	2,084	473	140	2,118	1,128	934	599	993	1,660
Scissors	638	632	73	495	9	496	306	225	481	859
Sealing-wax	1,402	2,370	1,459	1,866	3,954	1,343	2,209	1,543	1,862	3,653
Tape, twine, and thread ..	5,845	5,289	4,331	5,260	7,164	5,678	4,974	4,064	5,423	6,961
Vellum	273	1,278	566	..	859	309	729	621	490	356
Wafers	49	80	16	..	33	52	38	20	32	42
Miscellaneous	12,633	33,602	4,565	3,434	5,824	7,107	39,634	7,500	3,213	5,295
School books and materials.	97	6,890	5,320	3,187	12,129	7,720	3,480	3,250	1,562	16,834
Total ..	5,86,281	5,24,608	3,95,208	1,31,437	4,43,546	4,34,906	4,14,948	2,71,247	4,22,328	5,24,680

FORM D.

ABSTRACT of balances for each of five years.

Articles.	Balances.				
	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.
	RS.	RS.	RS.	RS.	RS.
Paper, drawing	20,977	21,803	28,358	32,088	26,266
,, lithographic	12,876	63,699	61,501	75,977	72,242
,, writing	80,966	1,35,295	1,77,835	1,14,996	85,828
,, printing	1,79,111	1,60,314	2,00,900	67,778	63,475
,, water-marked	4,080	5,380	4,872	5,574	4,585
,, blotting and marble ..	3,842	4,742	3,893	4,308	1,399
,, country manufactured and French.	38,242	34,377	72,268	73,235	61,972
Bibles and prayer books	5,562	5,497	5,008	4,809	4,579
Books, levelling, &c.	2,837	2,711	2,181	2,019	541
,, blank, leather-bound and marble-covered.	2,363	3,895	1,852	2,929	1,765
Colors and drawing materials ..	6,014	4,416	3,777	6,113	3,189

FORM D—*continued.*

ABSTRACT of balances for each of five years—*continued.*

Articles.	Balances.				
	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.
	RS.	RS.	RS.	RS.	RS.
Cloth, tracing	2,106	2,927	3,747	3,269	38
,, waxed, &c.	141	438	264	523	1,074
Hones and strops	288	381	229	228	457
Ink bottles and stands	679	975	2,022	2,480	1,526
,, powders, &c.	2,416	5,001	4,007	2,132	1,598
,, printing	3,931	4,927	4,663	4,202	4,093
Maps and sheets of Indian Atlas ..	6,164	5,994	5,921	12,974	12,544
Mathematical instruments ..	1,318	..	..	..	..
Parchment	195	336	330	191	550
Paste-boards, &c.	1,431	2,569	4,584	956	1,059
Penknives	725	1,259	574	143	110
Pencils	1,716	5,778	4,908	2,060	1,517
Quills	3,636	16,424	20,284	9,667	2,071
Rubber	1,021	1,872	2,132	1,623	1,094
Steel-pens and penholders ..	1,136	2,410	2,395	1,654	979
Slates	214	306	201	818	631
Sponges	2,566	3,716	3,590	2,348	2,806
Scissors	1,090	1,416	1,264	2,180	1,330
Sealing-wax	73	234	150	154	455
Tape, twine, and thread	531	846	1,113	956	1,159
Vellum	5	554	499	7	510
Wafers	55	97	93	79	70
Miscellaneous	23,370	17,338	14,403	4,070	4,599
School books and materials ..	15,620	19,030	21,100	24,176	19,471
Total ..	4,27,297	5,36,957	6,60,918	4,66,716	3,85,582

FORM E.

STATEMENT showing the value of Stationery consumed in the several departments.

Departments.	Value of stationery issued in		
	1881-82.	1882-83.	1883-84.
	RS.	RS.	RS.
Government Secretariat—			
Public department	1,895	1,211	833
Revenue department	1,486	1,284	1,344
Military department	1,369	1,177	481
Public Works department	1,722	1,983	758
Judicial—			
High Court, District and Sub-Judges ..	16,515	43,106	48,801
Revenue—			
Board of Revenue and Collectors, &c. ..	1,05,390	1,30,383	1,92,195
Police—			
Inspector-General, Commissioner, and Superintendents of Police	15,408	19,614	16,739
Jails	1,437	1,595	1,728
Registration department	12,645	37,748	43,098
Ecclesiastical department	227	632	230
Public Works department	20,930	22,813	32,033
Army and regimental schools	3,244	1,228	8,622
Miscellaneous	79,211	1,44,159	1,67,571
Sales	9,768	15,395	10,247
Total ..	2,71,247	4,22,328	5,24,680

ORDER—dated 28th July 1884, No. 1703, Financial.

The opening balance of stock in the Stationery office at the beginning of 1883-84 and the receipts and issues during that year are valued as shown below :—

	RS.
Opening balance	4,66,716
Receipts	4,43,546
Issues	5,24,680

2. The large increase in the value of the receipts as compared with those in the preceding year (Rs. 1,31,437) was due to the arrival within the twelvemonth of many articles of stationery due in 1882-83. The issues were similarly increased by the despatch to officers in March 1884 of large supplies required for 1884-85.

3. The receipts and issues for five years past are shown below :—

Year.	Receipts. RS.	Issues. RS.
1879-80	5,86,281	4,34,906
1880-81	5,24,608	4,14,948
1881-82	3,95,208	2,71,246
1882-83	1,31,437	4,22,328
1883-84	4,43,546	5,24,680

4. The Superintendent proposes to open a register showing the actual expenditure of every article of stationery in each office as soon as the additional hands sanctioned in G.O., No. 1457, dated 30th June 1884, are entertained. The Government attach much importance to these registers as an index to the consumption of stationery throughout the presidency. There can be little doubt that much wasteful extravagance prevails in many quarters. Year by year the cost of the head stationery and printing is mounting up, and the matter calls for careful and personal attention on the part of the head of every office. His Excellency in Council believes that large savings would result if heads of offices were themselves to look into the stationery accounts of their offices.

5. Some advance seems to have been made in substituting country for English articles, but the matter requires unremitting attention on the part of the Superintendent of Stationery.

6. There were 180 supplemental indents against 187 and 152 in the two years preceding. The Superintendent observes that "he is satisfied they were all necessary." The Government desire again to invite the special attention of all indenting officers to this point. Doubtless excellent reasons were adduced in each case to prove the necessity for the supplemental indent, but it is inconceivable that the exercise of fore-thought would not have obviated the need for some at least of these indents, which average fifteen a month.

(True Extract.)

E. F. WEBSTER,
Chief Secretary.

To the Superintendent of Stationery.
" Accountant-General.
" Departments of the Secretariat.
" Board of Revenue.
" Heads of departments.

Exd. C. Howarth.

23

Gobt. of (1884) Madras.

FINANCIAL.

Issued

Recd. Encl.

G.O., 28th July 1884, No. 1703.

JULY.

Stationery.

Reviewing the report of the stationery department for the year 1883-84.

No. 2643/152

Communicated to Officers in charge of Settlement Parties.

The greatest care and economy must be observed in the expenditure of stationery and the heads of offices are requested to give the matter their personal attention

Depᵗ of Rev: Settᵗ & Agrⁿ
19 August 1884

Director of Rev: Settᵗ & Agrⁿ

To

The Dy Director
No III Party

Revenue Department

228/84 Proceedings of the Madras Government Regd 2088

Read the following

24-27

Circular No. 86A.

FROM

E. C. BUCK, Esq., c.s.,
Secretary to the Government of India,

To

The Secretary to the Govt of Madras

Rev. and Agri. Dept.
Agriculture.

Simla, the 12th July 1884.

SIR,

I AM directed to forward, for information and for communication to the Agricultural Department, copies of a Circular No. 16P. of 16th August 1883, issued by the Director, Department of Agriculture and Commerce, North-Western Provinces and Oudh, describing the method adopted for reproducing village maps.

I have the honour to be,
SIR,
Your most obedient Servant,
E. C. BUCK,
Secretary to the Government of India.

Order thereon 31st July 1884 No 3280

Communicated to the Board of Revenue and the Director of Revenue settlement and agriculture

(True Extract)
(Sd) H. E. Stokes
Secy to Govt

To the Board of Revenue
" Director of Rev. Sett & Agre
" Supdt of Rev. Survey

Inv No. 2031/8

25
~~26~~

Circular No. 16P., dated Cawnpore, the 16th August 1883.

From—W. C. Benett, Esq., Director, Department of Agriculture and Commerce, North-Western Provinces and Oudh,

To—The Collector of

I am directed to invite your attention to a method for reproducing village maps, which prevails in the Sirdhana pargana of Meerut, and the Budhana, and parts of the Muzaffarnagar, parganas in Muzaffarnagar.

2. It was apparently the spontaneous invention of the Patwaris themselves, who found that it saved them much trouble, and its advantages are so obvious that it may be expected that no serious difficulty will be found in securing its general adoption.

3. An oblong wooden frame is made, on which muslin is tightly stretched, and this serves the purpose of a drawing board. It need not be the exact size of the map to be reproduced, and in practice in the disticts where it is used the same frame is handed about from Patwari to Patwari.

4. On the muslin is pinned the corrected map of which a copy is to be taken, and over that a piece of the fine English cotton cloth, known as *latta*. The frame with these pinned tightly on it is held up to the light, and the map beneath is traced on the super-imposed cloth, old disused boundaries being omitted, and the new boundaries (already marked in red on the map which is being copied) substituted.

5. The new map thus obtained represents exactly without erasions or alterations the field divisions of the village for the year in which it is made. It costs next to nothing, and takes very little time. It is found that a Patwari can without difficulty copy 250 numbers in the day.

6. The Board attaches much importance to the introduction of this simple and efficacious procedure, and is willing that you should charge the cost of making up as many wooden frames as you think you can get used, and issuing them to your supervisors. They should not at the outside cost more than a rupee each. It is estimated that one frame would be enough for eight Patwaris.

Govt. C. B. Press. Simla.—No. 391 D. G. R.—13-7-84—500.

Inv No 2031/H

1884.

GOVERNMENT OF INDIA.

REVENUE AND AGRICULTURAL DEPARTMENT.

AGRICULTURE.

26
~~27~~

To

Circular No. 86A.

Dated Simla, the 12th July 1884.

SUBJECT.

Forwarding copy of Circular by the Director of Agriculture and Commerce, North-Western Provinces and Oudh, describing the method adopted for reproducing village maps.

Govt. C. B. Press, Simla.—No. 391 R. & A. D.—13-7-84.—450.

Ru No. 2031/84

No. 1859

Communicated to the Officers in charge of Settlement Parties.
and to the Agricultural Reporter

Dept. of Rev. Sett. & Agre.
Madras 20 August 1884 (By order)

[signature]
1st. Assistant

To The Dy: Director
Party No. III

23.8.84 / C.4 /

Revenue Department

Proceedings of the Madras Government

Read the following

Reg. No. 9

27-30

INDIA OFFICE;
London, 5th June 1884.

Revenue.
No. 44.

To His Excellency the Most Honourable the Governor General of India in Council.

MY LORD MARQUIS,—In continuation of my despatch of the 8th ultimo, No. 31 (Revenue), I forward herewith a copy of a further letter* from the Director of the Royal Gardens, Kew, giving a summary of the information he has received concerning the wood used in China for tea-chests.

* Dated 30th April 1884.

I have the honour to be,

MY LORD MARQUIS,

Your Lordship's most obedient, humble Servant,

KIMBERLEY.

Dated Royal Gardens, Kew, 30th April 1884.

From—Professor W. T. THISELTON DYER, Assistant Director, Royal Gardens, Kew,
To—The Under Secretary of State for India.

WITH reference to my letters of March 29th and April 14th, on the subject of the wood used in China for tea-chests, I am desired by Sir Joseph Hooker to inform you that he has received from the Foreign Office further reports furnished by Her Majesty's Consular Officers in China upon this subject.

Without further troubling you with copies of these documents in detail, I may now sum up the conclusions which have been arrived at from their study in this establishment.

The wood most esteemed for the purpose is evidently that of one or more species of *Liquidambar*. Probably that most used is the wood of *Liquidambar formosana* (Hance)—a species apparently common in South China. The enquiry has, however, disclosed the existence of two other species in China, and of one of these—*Liquidambar acerifolia*—(Moxim) the wood is used for tea-chests in China.

With regard to the information contained in Mr. Currie's letter of March 28th, of which a copy was communicated to you on March 29th, I am to say that the specimen sent by Mr. Sinclair as an example of the wood used for tea-chests at Foo-chow-foo is almost certainly the wood of a *Liquidambar* and not as stated by him of *Pinus sinensis*. The wood referred to by Mr. Consul Oxenham as used at Chinkiang under the name of chestnut is probably also *Liquidambar*, as the Chinese, owing to the resemblance of the fruit, seem to regard them as related.

The wood of *Liquidambar* is undoubtedly used for the purpose at Kiukiang and Shanghai, while at Hankow the wood of the species which has been identified as *Liquidambar acerifolia* (Moxim) is largely employed. At the latter place deal (probably the wood of *Pinus sinensis*) is used and also at Tamsuy. At Swatow and Ningpo boxes are made from the wood of species of *Cuninghamia*; elsewhere the woods of willow and of *Sophora japonica* are employed.

Govt. C. B. Press, Simla.—No. 372, R. & A. D.—17-7-84.—600.

Iri No. 2068/84

No. 672 (Agriculture)

Revenue and Agricultural Department

Simla, the 21st July 1884.

Copy forwarded to the Govt of Madras for information, in continuation of the letter from this Department No. 556 of the 30th ultimo.

(By order)

(Sd) J. Holderness

Under Secy to Govt of India

Order thereon 2d August 1884 No. 3305

Communicated to the Board of Revenue, the Director of Agriculture, the Director of Govt Kinchona Plantations, Parks and Gardens, Nilgiris, and the several Planters associations, in continuation of G.O. 16th July 1884 Mis No. 3040

(True Extract)

(Sd) H. E. Stokes

Secy to Govt

To

The Board of Revenue
" Director of ~~Rev: Sett~~ & Agriculture
" ———— " Govt Cin. Plantns Parks & Gardens, Nilgiris
" " Association, Nilgiris
" " " Kotagiri
" " " Wynaad

No. 1858

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter

Dept. of Rev. Sett. & Agre. Madras 20 August 1884

(By order)

Sleaganato
1st. Assistant

To

The Dy: Director

Party No. III

Revenue Department
Proceedings of the Madras Government
Read the following

24.8.84 / 221

5TH AUGUST 1884, No. 1800, FINANCIAL.

Regd. 90

28 / 31

GOVERNMENT OF MADRAS.

FINANCIAL DEPARTMENT.

ORDER—dated 5th August 1884, No. 1800, Financial.

Referring to the notification in this day's Gazette, the Governor in Council desires the careful attention of all officers to the remarks contained in Financial G.O., No. 1485, dated 16th August 1881.

(True Extract.)

E. F. WEBSTER,
Chief Secretary.

To all heads of departments.

Order thereon. 19th August 1884 No 3583.

Communicated to the Board of Revenue Director of Revenue Settlement & Agriculture, Inam Commissioner, Superintendent of Revenue Survey and Director of Government Cinchona Plantations & Parks & for information and guidance

(True Extract)

(sd) C. Rowden
for Ag. Under Secy to Govt

Exd. J. Wright.

To The Director of Rev: Settt & Agri

Inil No 2524/84

Govt. of (1884) Madras.

FINANCIAL.

Issued

Recd. Encl.

G.O., 5th August 1884, No. 1800.

AUGUST.

Budget Estimates.

Drawing the attention of all officers to the remarks contained in G.O., No. 1485, dated 16th August 1881, regarding delay in submission of —.

No. 2719/156

Communicated to the [Off]icers in charge of Parties Nos. I, II, III & V

(By order)

Seagunah

1st Assistant

[D]ept of Reve: sett and Agriculture [M]adras 26th August 1884

[T]o The Dy: Director Party No III

6th August 1884, No. 910, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 1st July 1884, No. $\frac{2249}{\text{Forest } 168}$:—

Read—the following letter from Major I. CAMPBELL WALKER, Conservator of Forests, Southern Circle, to the Secretary to the Board of Revenue, dated Madras, 13th March 1884, No. 2884 :—

Board's Proceedings, No. 1316, of 11th May 1883, communicated, for information and guidance, G.O., No. 446, of 16th April, calling on Conservators of Forests to submit definite proposals with regard to the reclamation of sandy waste lands.

On receipt, I at once placed myself in communication with the Collectors and District Forest Officers of the maritime districts in my circle, viz., South Arcot and Tinnevelly on the east and Malabar and South Canara on the west coast.

Neither Chingleput nor Tanjore had District Forest Officers, and have been too short a time under forest conservancy to collect any reliable data or to submit mature proposals; and the sea-board of Madura is zemindari beyond the scope of our operations.

2. The Collector of South Canara recommended the planting of casuarina and *Calophyllum inophyllum*, which is being done on a small scale, nine acres of the former and one acre of the latter annually having been sanctioned as a preliminary measure.

The Collector of Malabar reported that most of the waste in his district is private property, but that "there are nearly 2,400 acres of sandy waste land along the sea-shore in the Ponáni Taluk and the professional department might see if they can make any use of it." (Deputy Collector, Southern Division, Malabar, to Collector, Malabar, under date 27th October 1883).

We have, however, no establishments in the Ponáni Taluk, and, as I gather that the matter does not press, I do not recommend any action in Malabar at present, and propose to restrict operations to South Arcot and Tinnevelly at the outset, extending them to Chingleput and Tanjore when we have gained experience and collected reliable data.

3. In the South Arcot District a good deal has been already done towards the reclamation of sandy wastes by casuarina planting both on Government and private account.

Mr. Wooldridge reports on the 15th December last that there are still 12,000 acres of such lands at the disposal of Government along the coast "chiefly sand waste and salt marsh waste, but partly also poramboke and abandoned fields on sandy loam."

It is proposed to plant this up by degrees with casuarina and other tress and shrubs which from our experiments and observations promise well, viz., *Pithecolobium, Saman, Peltophorum* (natural order *Leguminosæ* formerly referred to *Cæsalpinia*, natives of West Indies, Brazil and the Cape), *Melia indica, Eugenia Jambolana, Anacardium occidentale, Garcinia ovalifolia, Bassia latifolia, Erythrina, Albizzia Lebbek, Barringtonia racemosa, Prosopis Juliflora* and *glandulosa*, with the following species common to salt marshes at the mouth of the Coleroon and other places along the coast—*Avicennia, Rhizophora, Bruguiera, Lumnitzera.* Palmyra (*Borassus flabelliformis*), *Pandaneæ* and *Calamus* will also be tried along with the plants enumerated by Dr. Bidie in appendices A. and B. to his letter recorded with the Government Order under report. Rupees 4,500 has been provided in the South Arcot forest budget for 1884-85 for planting 150 acres at Rs. 30 per acre; but, as the funds from which it was proposed to meet the expenditure, viz., "rents of trees and topes," have not been made available, and Government have, by recent orders, reduced our allotments by Rs. 70,000 (for both circles), I fear it may be found necessary to curtail operations.

4. In Tinnevelly, the following information is available from memoranda kindly supplied by the Collector.

The teris or sand dunes referred to in paragraph 599 of Mr. Brandis' suggestions are situated in the Tenkarai Taluk within the limits of ten villages.

Their aggregate area is 20,250 acres. The largest is Kudirai Malai (9,468 acres), in which and the Nazareth teri (915 acres), operations have been chiefly conducted. 207,000 palmyras have been sown in the Kudirai Malai teri since 1876, of which 180,000 have grown into trees; there are 27,000 palmyra trees established in the Nazareth teri.

Upwards of 10,000 trees of other descriptions are reported to be established in the different teris. The chief descriptions are Mango (*Mangifera indica*), Babúl (*Acacia arabica*), *Melia indica*, *Albizzia Lebbek*, *Eugenia Jambolana*, *Bassia longifolia*, *Tamarindus indica*, *Albizzia amara*, *Thespesia populnea*, *Anacardium* and *Ficus* (several species).

The ground is now fairly covered with nanal grass (*Saccharum spontaneum*) and the goat-foot creeper (*Ipomœa pescapræ*), and the beneficial effects of the protection and planting are being generally experienced.

5. Considerable sums have been expended since 1876 from Jungle Conservancy Funds, but it is impossible to furnish reliable accounts, as the amounts are mixed up with other expenditure in the late Jungle Conservancy accounts.

During the ensuing official year we propose to sow 600,000 palmyras in the Kudirai Malai teri at a cost of Rs. 1,300 and to expend Rs. 1,000 in manuring the trees of this description already established, which will be repaid by the earlier production of fruit and more vigorous growth.

Experiments in planting or sowing the descriptions enumerated in paragraph 3 of this report will be inaugurated, and Mr. Hayne is collecting large quantities of the seed of the umbrella thorn (*Acacia planifrons*), which thrives well in the neighbourhood. I shall also recommend him to experiment with korai grass (*Cyperus textetis*) and the *Saccharum dœmonum*, if I can procure seed.

The large extent of the teris involves the prosecution of operations on a regular system during a series of years at considerable expense. I have little doubt that, if this is done, the result will be very beneficial in fixing the shifting sands and eventually rendering at least portions of the land capable of bearing crops of cereals.

6. The financial results should also prove favorable, but I should here remark that there are many palmyras on the teris held on putta, the assessment on which is now credited to Land Revenue Miscellaneous, not to "Forests."

Considering the sums expended from the late Jungle Conservancy Fund and to be expended from "Forest" in improvement, it would seem only fair that the forest revenue should be credited with the rents of all the trees situated on the areas under the control of that department, which will shortly be demarcated and classed as reserved lands, should the Board and Government see no objections.

The question of the tree rents generally is now under reference (Board's Proceedings, No. 53, of 10th January 1884), and the final decision with regard to them must naturally exercise a very important influence on the nature and extent of our operations for reclamation and improvement of the Tinnevelly teris.

7. In addition to the "teris" we have a reserve near Tuticorin, referred to in paragraph 601 of Mr. Brandis' suggestions, the partial protection of which has proved most beneficial to the town of Tuticorin by preventing the drifting sand, which formerly threatened almost to engulf the town. The improvement in this respect is admitted on all hands.

The reserve contains *Acacia planifrons*, with some *A. Latronum* and *Zizyphus*, with an undergrowth of *Cassia auriculata* and the creeping grass *spinifex squarrosus*. I visited it in January last, with the District Forest Officer, and found it had been fairly protected against cutting, and that useful inspection paths, which serve also as block division lines, had been cut at an expense of Rs. 259-11-0 (Board's Proceedings, No. 4274, dated 25th May 1883). Mr. McDougoll's claim to land within the reserve boundaries has since been rejected by the Collector, and steps are being taken to

improve the boundary line, demarcate, and protect as reserved land, under Section 26 of the Act, pending settlement and constitution as a reserved forest under Chapter II.

8. Whilst engaged on this report I am in receipt of a resolution of the Director of Agriculture, No. 380-A, of 11th February 1883, communicating a letter from the Honorary Secretary, Agricultural Society, on the reclamation of saline tracts. It will be observed that such tracts will naturally fall within the scope of our operations under the Order of Government of 16th April 1883, regarding the reclamation of sandy wastes, which I propose gradually to extend to the Chingleput District, to which Mr. Steavenson's letter specially refers.

The Collectorate or Municipality of Madras is not within my jurisdiction or that of the Conservator, Northern Circle, and I do not advocate its being brought within the scope of our operations. Private enterprise has already done much in the direction of planting casuarina and korakapillai (*Inga dulcis*), and may, I think, be safely relied on so far as the immediate vicinity of Madras is concerned.

9. With regard to paragraph 3 of the resolution, our attention will certainly be directed to the protection and improvement of waste lands in the Chingleput District at the disposal of Government, but we must, I submit, concentrate and restrict our efforts to certain well-defined areas over which we can exercise more or less absolute control.

To embark on a crusade against all the old women who stub up roots and collect leaves on the roadsides and every piece of ground they can enter on openly or by stealth (I saw them recently removing quantities of leaves and twigs from Government-house, Guindy!) would be beyond our legitimate province and only render the department and its officers more unpopular than they are.

Read—the following letter from J. S. GAMBLE, Esq., Conservator of Forests, Northern Circle, to the Secretary to the Board of Revenue, dated Ootacamund, 18th June 1884, No. 493:—

I have the honor to submit the following remarks in reply to the order contained in Board's Proceedings, No. 1316, of 11th May 1883, which communicated the proposals made by Dr. Balfour on the subject of "sand-binding plants" with the report and recommendations of Dr. Bidie.

2. I have, during the past year, seen a considerable portion of the coast line of the districts comprised within this circle, which coast line extends over a length of more than 600 miles. There are, I believe, some 400 miles more on the east coast of the districts of the southern circle so that the coast line referred to by Dr. Bidie extends some 1,000 miles in length, and assuming the breadth of the sandy belt along the coast to be one mile broad (it is often less, but often also much more, and one mile is probably a fair average), and that operations are confined to Government lands only and that such lands cover one-fourth of the area only, the proposals amount to the undertaking of a vast work of planting, sowing and other methods of reclamation over an area of 250 square miles of country. Of the 130 miles of coast of the Ganjam District, about 75 miles belong to Government in the Taluks of Berhampore and Chicacole, and the whole of this length consists of a broad belt of sand and sandy dunes, and sometimes with pools of water or salt marshes behind, but all land which might be reclaimed if Dr. Bidie's proposals were carried out. On the coast of Vizagapatam District, there are about 120 miles, of which about 35 only are in the Government Taluk of Sarvasiddhi, whose coast consists of a sandy belt with low dry hills covered with scrub behind. These 35 miles would all require restoration. In the Godávari District, there is a coast line of 110 miles, of which nearly the whole, or let us say 80 miles' length, would require treatment. On the Kistna coast line, there are another 120 miles, part of which, however, is backed by mangrove (*Avicennia*) jungles, but the rest of which contains a broad belt, often two to five miles across, of sandy waste which might be planted. In Nellore, there is a length of 150 miles, quite 100 of which is Government land and is still a sandy waste. Government has made some plantations of casuarina at various places on the coast of this and the Kistna District, and private

persons are also planting, but the length done bears but a very small proportion indeed to the whole. Thus we have in this circle—

Ganjam	75
Vizagapatam	35
Godavari	80
Kistna, half, say	60
Nellore	100

350 miles of coast line on which such operations as those recommended by Dr. Bidie would have to be undertaken. I can form but very little idea of what the cost of such works as those suggested in Dr. Bidie's paragraph 4 would be, but casuarina planting cannot well be estimated at less than Rs. 100 per acre for the eight years during which the plants have to be specially tended. I cannot suppose that other methods of reclamation are quite as expensive as the planting of casuarina, but I feel sure that no planting of any value will be done under Rs. 30 per acre for the whole number of years till the plants are established. Assuming then that, of over 350 square miles, 100 may be omitted as not very necessary, 100 are planted with casuarina and 150 by other methods, the cost will be nearly 100 lakhs of rupees, so that even if spread over 100 years, one lakh would have to be provided yearly. I doubt if Dr. Bidie quite realized the magnitude of the work he recommended so confidently as a task for the Forest Department.

3. I doubt also if it has been fully realized what is actually being done by private enterprise, or, more correctly speaking, perhaps, private speculation, on the continued high price of fuel in Madras. Lands are being taken up on the coasts of the Nellore and Kistna Districts for the purpose of casuarina planting by native speculators, and, as is well known, that around Madras, from Ennore down to the Pálár river or further, private plantations have reclaimed a belt of coast sands of about half-a-mile in breadth. But these plantations will all disappear if fuel gets cheaper, and they cannot really be looked on as permanent reclamation. Still, what is being done cannot but improve the land and possibly increase the area capable of growing crops.

4. I am very doubtful whether casuarina alone is a good tree for permanent reclamatian, for it seems apt to die out after a time, and, in the more northern districts, does not send out coppice, shoots and suckers as it does in the moister climate of Chingleput. But it is probably the best to begin with, and other species can be tried afterwards.

5. What I would recommend being done is this: there are many localities on the coast where plantations would not only be useful as a protection but valuable as improving the supply of fuel. A plantation of some size at Gopálpur to the south of the town would probably stop the sand from drifting round the houses as it does now. Mr. Minchin has started some planting, but on a very small scale only, while in my opinion what we want is a plantation of good size, say two miles long by half-a-mile wide, for such an area could be profitably permanently worked for fuel not only for Gopálpur but for Berhampore and the adjoining country.

6. A similar plantation might be made at Calingapatam between that place and Mafuzbanda, and prove very valuable for the supply of Chicacole. The Collector of Vizagapatam has proposed plantations of casuarina in the Sarvasiddhi Taluk, and possibly some may be found advisable at the same time as means are taken to improve the growth on the low hills. Near Masulipatam and Cocanada, plantations of good size would be worth undertaking as the produce would find a sale in those places. The present plantations are too small and scattered and difficult to protect cheaply, and it is very doubtful if they will ever repay their original cost. The Nellore plantations are larger, better, and their extension along the sea coast is actually in progress. But before anything is done, the work of the selection, demarcation and settlement of reserves must be first completed, proper establishments organized and proper working thoroughly established, and then if well-prepared proposals are made out and provision made in the budget, I think we shall be able to make some useful plantations in localities where they will be of value both for protection and for produce. I would strongly deprecate any attempt to go to work in a hurry and without a fully-considered plan.

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~~34~~

7. I think that the following localities may be recommended to be considered when opportunity offers :—

1. Gopálpur, } in Ganjam.
2. Chatrapur, } in Ganjam.
3. Calingapatam or Mafuzbanda, } in Ganjam.
4. A well-selected locality in Sarvasiddhi Taluk of Vizagapátam.
5. A good locality near Cocanada in Godávari District.
6. A good locality near Masulipatam in Kistna District.

8. But what can *now* be done is to select a number of good pieces of Government waste land along the coast of the five districts and have them set apart as fuel and fodder reserves under Rule 8 of the rules under Section 26. When planting operations are afterwards undertaken, such localities as are selected for planting can be transformed into reserved forests.

9. In regard to the question of fixing the sand by means of sand-binding plants or otherwise, I think that, unless Collectors bring to notice that in any special locality such work is urgent, no action is at present necessary. Should it be brought to notice that in certain special localities the intervention of Government is necessary and urgent, then I consider such works as are ordered should be carried out by a special establishment under the supervision of the Director of Agriculture or the Conservator of Forests as Government may consider proper. Any large project of reclamation would necessitate heavy expenditure with little or no return, except in the possible eventual conversion into agricultural land of what are now barren wastes.

10. Turning to the question of the reclamation of salt lands referred to in Board's Proceedings, No. $\frac{1168}{\text{Forest 59}}$, of 31st March 1884, which circulated a letter from Mr. J. Steavenson, Honorary Secretary, Agri-Horticultural Society of Madras, I beg to submit copy of letter from the Collector of Nellore, No. 62-F, of 5th April, on the subject. I presume the localities referred to in paragraph 6 of Mr. Steavenson's letter are in the Chingleput District and not in my circle ; but I think in any case he should be asked to specify them definitely, for I strongly suspect that the lands he refers to are not Government property but private holdings. If there are any in the Nellore District the attention of the District Forest Officer will then be drawn to them, but it is quite impossible to take definite action on such an indefinite complaint as that made by the Secretary, Agri-Horticultural Society.

11. As pointed out by the Collector of Nellore and Mr. Vincent, plantations could undoubtedly be made on salt lands like the parts of the Pulicat Lake north of Dykes' bund, but, apart from the grazing objection raised by the Collector, there is the financial question and the certainty that heavy expense would be necessary with little corresponding return. Salt marsh lands are really undergoing a process of self-reclamation, and if in any special localities it would seem that artificial action is necessary to hasten that reclamation, then I submit the matter should be considered specially in each case, but any attempt at large works on a hasty plan would only result in heavy expenditure with little or no corresponding return to Government.

ENCLOSURE No. 1.

From the Collector of Nellore, to the Conservator of Forests, Northern Circle, dated Nellore, 5th April 1884, No. 62-F.

In reply to your No. 1727 of the 8th March, I have the honor to inform you that it is not at present proposed to undertake the reclamation of any of the salt swamps in this district. The suggestions made by Mr. Steavenson would be difficult of application at present, and that gentleman much over-estimates the reproductive powers of nature on land which has been covered for some time with salt-water. It is quite certain that, if, say, the parts of Pulicat Lake above Dykes' Bund could be deeply trenched, and high banks thrown up, tangédu, tumma, dichrostachys cincrea and other hardy shrubs would soon grow there, and an example of this is the bund between Buckingham Canal and the Pulicat Lake. But the expense of this would be enormous, without being of any practical benefit to the community.

2. This refers to the worst sorts of salt land, where, notwithstanding the absence of cattle and goats, nothing whatsoever grows. The salt marshes covered with grass in the hot weather

as mentioned in Mr. Steavenson's paragraph 5, form at present most valuable fodder reserves, and although Mr. Steavenson does not say what he intends to do with them after they are converted into forests of casuarinas, banians, mangoes, &c., it is presumed that he hopes to see them cultivated some day. This would, I submit, be a very great error; already in the case of the casuarina plantations, very large areas of this grazing land, which was urgently needed for village wants, have been taken up, and although the value of these lands for grazing purposes might be considerably improved by drainage, any steps which would still further curtail the village pasture lands would be most ill-advised.

Resolution—dated 1st July 1884, No. $\frac{2249}{\text{Forest 168}}$.

Submitted for the information of Government, with reference to G.O., No. 446, dated 16th April 1883, and G.O., No. 370, dated 14th March 1884.

2. Both Conservators grasp the fact that this question of reclaiming sandy wastes is no longer a question of theoretical botany, but of practical agriculture, or rather of commerce.

3. The list of plants which are useful in the various stages of reclamation is so large, and the places in which the reclamation has been successfully accomplished are so numerous, that not only every Forest Officer but also every ryot on this coast knows that these sandy wastes can be brought under cultivation by processes more or less expensive.

4. A professional Forester might advise the reclaimer upon the choice of a plant to serve as his agent in the work; the mangrove in a tidal swamp, the screwpine to protect his fields from drift, or the palmyra to settle inland sands (such as those which threaten the town of Proddutur in Cuddapah District), but usually there is a choice of plants, any one of which would serve, and the only question is whether it is worth while to incur the expense.

5. The area is so vast and the resources of the Forest Department are so fully occupied with the existing forests that for many years to come Government cannot hope to engage in this work upon any large scale and must restrict operations to any locality where they are specially desirable as suggested by the Conservator, Northern Circle.

6. Private enterprise has done much and may do more, but this must be left to be ruled by the market price of produce. If it pays the ryot to cultivate swamps on the coast, his paddy fields and cocoanut topes will creep down into these swamps. On the other hand, as Mr. Gamble suggests, should the price of firewood in Madras fall, much of the area on this coast now planted with casuarina trees will probably relapse into sand dunes.

7. Dr. Bidie's suggestion that all waste sandy tracts in the presidency should be reclaimed by the Forest Department, and Mr. Steavenson's that the scrub jungle on Government land should be strictly preserved, are not practical although the object in view in each case may be desirable. The Forest Department has already more work to do than it can thoroughly perform, and Government in G.O., No. 744, dated 12th June 1884, have decided that no restriction is to be placed on the taking of leaves for manure except in reserved forests and lands under special protection, on the ground that the Forest Department is not strong enough to enforce a general restriction of that kind.

(True Copies and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Conservator of Forests, Southern Circle.
" " " " Northern "
" " Deputy Conservator of Forests, in charge of Central Office of Accounts.

32/35

Order—dated 6th August 1884, No. 910, Revenue.

Forest, No. 120.

The Board's observations and the proposals of the Conservators are approved.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, Brigade-Surgeon G. Bidie, M.B., C.I.E.
,, the Honorary Secretary, Agri-Horticultural Society.

Exd. J. Henricus.

100 Copies.

Inw No. 2485/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

No. 2807

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle diseases

Dept. of Rev. Sett. & Agre.
Madras 28th August 1884

(By order)

[signature]
1st. Assistant

To
The Dy: Director
Party No. III

G.O., 6th August 1884, No. 910.

AUGUST.

Reclamation of Sandy Wastes

along the coast.—The Board's observations and the proposals of the Conservators regarding the —, approved.

19 8th / 44

Revenue Department

Proceedings of the Madras Government

Read the following:—

Circular No. 81A.

33 / 36

FROM

E. C. BUCK, Esq., C.S.,

Secretary to the Government of India,

To

Rev. & Agri. Dept.
Agriculture.

Simla, the 4th July 1884.

SIR,

I AM directed to invite attention to paragraph 5* of the Review by the Director of the Department of Agriculture and Commerce, North-Western Provinces and Oudh, of the report of the Cawnpore Experimental Farm for the *kharif* season of 1883. The method there adopted of instituting a comparison between yields on the basis of 100 is a convenient and simple one, which may be noted for adoption by Agricultural Departments whenever it is convenient ~~to do so~~.

* 5. The results from deep and shallow ploughing for cotton confirm those for last year, and show, though not perhaps to the extent that might have been expected, that the advantage of a moderately deep ploughing is even greater in a dry year like the last, than in a year of ordinary rainfall. Taking 100 as the yield from two shallow ploughings, the proportions of the yield to that obtained by one ploughing at different depths have been as follows:—

	Year.	Shallow.	5-inch.	9-inch.
Farm	1882	100	114·8	107·6
	1883	100	118·1	113·9
Common cultivator ..	1883	100	112·3	112·8

I have the honour to be,

SIR,

Your most obedient Servant,

E. C. BUCK,

Secretary to the Government of India.

Order thereon 6 August 1884, No. 3371

Communicated to the Board of Revenue and the Director of Agriculture.

(True Extract)

(Sd) H. E. Stokes
Secretary to Government

To The Board of Revenue
" Director of Rev. ~~Sett~~ + Agriculture

Inw No. 2098/84

34
37

1884.

GOVERNMENT OF INDIA.

REVENUE AND AGRICULTURAL DEPARTMENT.

AGRICULTURE.

To

Circular No. 81A.

Dated Simla, the 4th July 1884.

SUBJECT.

Recommends for adoption the method adopted in the Cawnpore Farm Kharif Report for 1883 for showing the results of ordinary cultivation.

G. C. B. Press, Simla.—No. 353 R. & A. D.—5-7-84.—500.

No. 1815

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre.
Madras 15 August 1884

(By order)

[signature]
1st. Assistant

To The Dy. Director
Party No III

16TH JULY 1884, No. 859, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—again G.O., dated 8th August 1883, No. 961, Revenue.

READ—also the following despatch from the Right Hon. the EARL OF KIMBERLEY, Her Majesty's Secretary of State for India, to His Excellency the Right Honorable the Governor in Council, Fort St. George, dated India Office, London, 13th December 1883, No. 35 (Revenue) :—

I have perused with great interest the valuable papers printed at pages 151—187 of your Revenue Proceedings of April last, relative to the existing conditions of the Revenue Settlements of the districts of Malabar and South Canara.

2. Entirely concurring with the opinion of your Excellency's Government that there is nothing in the revenue history of these districts which give the present assessments an unalterable character, I am glad to learn from your letter to the Government of India, No. 460, Revenue, of 18th April last, that you contemplate the extension to Malabar and South Canara of survey operations in view to a revision of assessments.

3. Some observations, however, of the Board of Revenue in their Resolution, No. 2747, dated 11th November 1882, I am unwilling to let pass without comment. After remarking (paragraph 8) that the difficulty in revising assessments in South Canara, as well, it would appear, as in Malabar, is "the private property not of the payers of assessment but of the payers of rent," the Board proceeds to argue that the payments of the mulguenidars or permanent tenants on account of their holdings cannot in any shape be enhanced, and they consequently recommend (paragraph 10) that the resettlement of Canara shall be "based upon existing facts," and that the new assessment, as far as these holdings are concerned, shall not exceed half the existing rent which the wargdar or original proprietor receives from his permanent tenants, independently of the value or of the area of the holdings which pay it.

4. This in reality, your Excellency will observe, concedes the principle of a permanent settlement, which, it has been authoritatively decided, and the Board admit, has never been extended to the districts in question. It will lead to an undesirable and, so far as I can at present perceive, unnecessary difference of practice not only in the two divisions of the province of Canara (as I conclude that the Bombay Revenue authorities do not concede any claim of a mulguenidar to exemption from ordinary assessment), but within the two districts themselves which could not but be disagreeable to wargdars who would see their tenants' lands more lightly assessed than their own. It may eventually cause considerable loss of revenue. It is inconsistent with the general principle of Indian Revenue law that the produce of all land, the revenue of which has not been alienated by the State, is liable for the revenue demand, and it appears to be at variance with the judgment of the Bombay High Court in the case of Vaikuntha Bapuji *v.* The Government of Bombay. That judgment, indeed, did not directly decide the rights of mulguenidars. But the Chief Justice remarked that "the result of an enhancement by the State of the mala-wargdar's assessment to an amount exceeding or equalling the rent received by him from the mulguenidar would be an annihilation of the interest of the mala-wargdar in his property if the State had not, or failed to exercise, the power imputed to it by Sir T. Munro of raising the mulguenidar's rent in proportion to the enhancement of the assessment on the mala warg." This judicial dictum appears to me to dispose of the claims of the mulguenidars to hold at permanent rents to the detriment of the Government revenue.

5. I observe that your Excellency has not approved the recommendations of the Board, and that you leave the terms on which the settlement is to be revised for future decision. But the question which forms the subject of the despatch is one of so great importance that I shall be glad if your Excellency will reconsider it, and acquaint me with your views upon it as soon as may be practicable.

READ—also letter from the Government of India, dated 28th January 1884, No. 88 R :—

ABSTRACT.—Forwarding copy of a despatch from the Secretary of State on the question of the revision of the land-revenue assessment in the districts of Malabar and South Canara, and requesting the expression of the views of this Government on the points noticed by the Government of India.

READ—also the following Proceedings of the Board of Revenue, dated 20th March 1884 No. 1002 :—

Read—the following letter from C. A. GALTON, Esq., Acting Collector of Malabar, to the Secretary to the Board of Revenue, dated Calicut, 6th November 1883, No. 4509 :—

I have the honor to reply to G.O., dated 8th August 1883, No. 961, Revenue, communicated with the Board's Proceedings, dated 28th idem, Mis. No. 7324, calling for an expression of my opinion whether the principles recently approved by the Government of India for regulating the revision of the land assessment in Northern India are applicable to the case of Malabar.

2. The principles adverted to appear to be as follows.

To obviate the vexations which are inseparable from a system of reassessment based on a valuation of the soil, and to enable proprietors of land to forecast with tolerable certainty and without official aid the enhancement of revenue to which they will in future be subject, it is proposed to fix a period for each district, after which no further attempts should be made to obtain fresh valuations of the soil, the agricultural value of each estate as determined by the actual rental being taken as the basis for future adjustment. The settlement should be based on actual statistics, and should be such as to secure to land-owners the profits of all improvements which they may make. The Settlement Department is to maintain a record of the actual changes which may take place in each year subsequent to the last valuation of each estate, and the increment due to the State is to be calculated therefrom under fixed rules which every landlord can apply to his own case, an enhancement of the demand being permissible on three grounds only, namely—

(1.) Increase of area under cultivation.
(2.) Rise in prices.
(3.) Increase in produce, due to improvements effected at Government expense.

3. The method of applying these principles in introducing the new system of settlement is thus described. The first step is to determine for each estate the initial assessment which must be the basis of all future revisions of assessment. Districts are divided into three classes—

(1.) Those in which the revenues can be summarily accepted at once as the initial revenue.
(2.) Those in which the revenue of many estates are unduly low, but can be summarily estimated on an examination of the village papers.
(3.) Those in which no estimate of the revenues can be made without a resurvey and revision of the record. In dealing with the last class, the Settlement Officer's operations are to be directed primarily to a record of the acknowledged rents and not to an estimate of what they ought to be, nor to an elaborate valuation of the land. In the case of estates of the second class, the initial revenue is to be fixed at a certain proportion of the rental assets, the settlement being made for a term of years, but no increment taking effect until the termination of the current contract.

4. The initial revenue being once fixed, future adjustment of the demand would be based solely on a consideration of the three conditions specified at the close of paragraph 2 *supra*. For the purpose of adjustment with reference to the first condition the initial area of cultivated land is to be fixed with reference to the village accounts in the case of districts of the first and second classes; in the case of districts of the

third class, the determination of the initial area must await completion of survey. The uncultivated land would then be assessed at moderate rates, and the revenue of newly-cultivated land would be calculated and levied at those rates on the next revision of settlement, but not before. For the purpose of adjustment with reference to changes in the value of produce, an initial schedule based on an average of a series of years (excluding years of scarcity) immediately preceding the year which is taken as the commencement of the settlement is to be framed, and the revenue is to be periodically adjusted on a consideration of prices ruling at the time of revision as compared with the initial schedule. The details, such as staples to be selected, stations at which prices are to be registered, and period for which the average is to be calculated, and allowance to be made so as to guard against too great an enhancement which might result from increase of assessment in exact proportion to rise in prices are matters left for settlement hereafter. The revision of settlement so determined with reference to variations of price and area is to take effect from a prospective date named so as to place landlords in possession of an immediate knowledge of the future liabilities to which their estates will be subject, and thenceforward readjustments will take place at fixed intervals.

5. As to enhancement of the demand on the score of improvements effected at Government expense, it is intimated that no claim will be advanced to share in profits arising indirectly from outlay by the State as, for instance, by construction of railways and works of the kind, except in so far as a rise in prices results from such improvements.

6. Such are the main features of the proposed scheme of settlement so far as the landlord is concerned in his relations with the State. The Government of India further point out the importance of endeavouring to secure at the same time a fair and reasonable measure of protection to all tenants, and suggest that, if possible, enhancement of rent should be limited to somewhat the same grounds as those which are held to justify an enhancement of the revenue and to a similar proportion of increase, remarking that this can only be done effectually by introducing a certain security of tenure in the case of those classes of tenants who are now unprotected by the law, the means by which this can be effected depending greatly on the existing conditions of tenant right in each province.

7. I am of opinion that the principles approved by the Government of India may be applied in revising the assessment of this district. The chief difference between the method of settlement described and that which has hitherto been followed in this Presidency is the substitution of assessment with reference to the actual rental of the land for assessment on the basis of a valuation of the soil. The principle which it is proposed to apply is that which has all along governed the assessments in Malabar, the landlord's rent known as páttam being the basis of the existing Government demand. In the case of rice lands, the gross produce was first ascertained, a deduction was made for seed and expenses of cultivation; of the remainder, one-third was left to the cultivator, and the balance constituted the páttam, and was divided between the Government and the landlord in the proportion of six-tenths and four-tenths, respectively, the Government share being commuted according to certain prescribed rates. In the case of garden lands, one-third of the gross produce was left to the cultivator, the remainder being divided equally between the landlord and the State. It is true the assessment is levied in the shape of a fixed rate per tree, but the basis of the settlement was a division of the gross produce between the cultivator, landlord and Government, the share which fell to Government being assessed on the village in the lump and distributed ratably by the villagers themselves over all the trees in the village with reference to their classification according to their productive qualities so as to avoid the necessity for individual assessments (*vide* paragraph 260 *et seq.* Appendix II of Mr. Logan's report). The foundation of the present tree-tax thus consisted in a valuation of the Government share of the páttam; and, even in the case of garden lands, a settlement on the basis of rental would not be a violation of the principles on which the existing assessment is based. As proposed in Board's Proceedings, dated 13th November 1882, No. 2755, the tree-tax should be abandoned; and, the average value of the produce per acre being ascertained, the Government

demand should be fixed with reference to the share of the páttam, which originally regulated the existing demand per tree. So long as the *proportion* of the landlord's rent which Government have hitherto taken be adhered to, the proposed method of adjustment appears to be entirely in accordance with the nature of previous settlements.

8. As to the principles of settlement indicated in paragraph 13 of the letter to the Government of the North-Western Provinces, they are, I believe, those which have hitherto guided the Settlement Department in this Presidency, and would be applied in the ordinary course when this district comes under resettlement with reference to the decision of Government in G.O., dated 18th April 1883, No. 459. The first two alone would operate, as cultivation in this district is not dependent on works of irrigation constructed at the cost of Government.

9. Next as to the method of applying the approved principles, this district clearly falls under class 3 of those described in the Government of India scheme, viz., those in which no estimate of the revenues can be made without a resurvey and revision of the record. The existing assessments cannot be accepted as representing the proper equivalent of the Government share of the páttam both because the price of produce has doubled since the date when the existing commutation rates were fixed (*vide* page 195, Appendix II; pages 366-67, Appendices VI and VII to Mr. Logan's report and his letter, dated 1st May 1882, embodied in Board's Proceedings, dated 13th November 1882, No. 2755), and because the recorded area on which the assessments were originally calculated is probably considerably below the true extent, and there are encroachments which have never been brought to light. A survey and revision of commutation rates is therefore essential for the determination of the initial area and initial revenue, and here it is necessary to point out that a *field* survey will be necessary in Malabar. The scheme of settlement which the Government of India propose for the North-Western Provinces is evidently framed with reference to a different condition of things. Reference is made throughout to *estates* consisting, apparently, of an aggregate of fields and subject, it is presumed, to a lump assessment as is the case of the wargs in South Canara, whereas in Malabar the fields are separately and independently assessed as elsewhere in the Madras Presidency. Each field must, therefore, be surveyed and assessed.

10. The application of new commutation rates and revision of areas presents no difficulty if the Settlement Officer's operations in Malabar could be limited to a record of acknowledged rents and a valuation of the Government share of such rents according to the fixed proportion for wet and garden lands, respectively (*vide* paragraph 19 of the letter from the Government of India), the matter would be comparatively simple, but the landlords have generally encroached on the cultivator's share of the produce and appropriated a portion to themselves. This is evident from a consideration of the figures given in Appendix IV to Mr. Logan's report, which shows that in the case of 110 estates inquired into, the rents payable by the tenants was Rs. 1,91,375, whilst the Government assessment only amounted to Rs. 12,317. The existing rents cannot, therefore, equitably be taken as the basis of the settlement, and a revaluation of the gross produce will be necessary before it can be determined what the fair share of Government is. Such a valuation presents no difficulty; the real obstacles to the introduction of an equitable settlement on the lines indicated by the Government of India consists in the fact that, under the peculiar nature of the tenures prevailing in this district, it will be difficult to devise any means by which the interests of the tenants can be protected, and they can be secured against a still further enhancement of the present exorbitant rents. The Government of India speak of the Kanamkar as a *permanent* tenant, but it will be seen that the proportion of permanent tenures is inconsiderable; out of 10,328 lands held by 5,845 persons in 110 estates examined, only 338 were held by 159 persons on permanent tenure (*vide* paragraph 124 of Mr. Logan's report).

11. The tenure is in few cases permanent, the terms on which the land is demised are subject to periodical revision both in the case of the actual cultivator and the intermediaries, and there is nothing to prevent the landlord from passing on to the intermediary and the latter to the actual cultivator any enhancement of revenue which

may result from a revision of existing assessments. The Board's proposal that the landlord should be held immediately responsible for the Government revenue would not secure the desired end, because the liability could be easily shifted to the Kanamkar or mortgagee in practice. The enhanced assessment could easily be obtained from the latter by means of an increase of the renewal fee without payment of interest on the difference on the next occasion of the settlement of terms, and as rents would nominally remain the same, such evasion of the liability to pay the revenue could never be prevented. Such is the demand for land in Malabar that there would probably be no difficulty in finding a mortgagee willing to accept the terms should the previous encumbrancer decline. The intermediary again would be in a position to pass on the extra burden to the actual cultivator of the soil with the powerful engine of eviction for non-payment of rent to aid him in enforcing his demands. Mr. Logan's report shows that the competition for land is so keen that the tenant cannot stand out for his legitimate share of the produce as others can readily be found who are willing to pay a fine for the privilege of enjoying such share. Unless freedom of contract is to be denied to the land-owning class of Malabar, and the tenants' rents are to be settled by the State, security from eviction being assured so long as such rents are paid as appears to be the plan suggested in paragraphs 31 to 34 of the letter from the Government of India to the Government of the North-Western Provinces, I do not see how the landlord is to be compelled to pay the Government assessment or rather to be prevented from recovering from his tenants in practice what he is himself supposed to pay in theory.

12. No scheme of settlement which does not deal with this aspect of the question can possibly succeed, but it does not appear to me to be touched in Board's Proceedings, dated 13th November 1882, No. 2755. It is proposed to apply to Malabar the principle recommended for adoption in South Canara, but I would respectfully point out that the case of the Canara Mulguenidar seems to be very different from that of the tenant in Malabar; the former has permanency of occupancy right and pays a rental which in process of time has become extremely moderate, the latter has in the large majority of cases no occupancy right, whilst his payments to his landlord have become exorbitant; the rental can therefore be made the basis of the settlement in the former case without injustice to the tenant; in the latter, it cannot. It is necessary, as regards Malabar, to go further and protect the tenant, who in Canara requires no protection from his landlord. It is in this that the real difficulty of touching the existing state of things consists. The allowance of a more liberal scale of compensation for disturbance than that which at present prevails will, to a great extent, check arbitrary eviction so far as garden lands are concerned, but the cultivator of rice lands will not be benefited thereby, and he it is who chiefly requires protection. As Mr. Logan says at paragraph 368 of his report: "The latter (renters of gardens), even though their holdings are small, are to a great extent in independent position, because so much lies in their power. If they are rack-rented they take all they can get out of the trees and put back as little as possible, and at the next letting the landlord finds this out to his cost." What measure of protection can and should be afforded to the rice-land cultivator is a very difficult question, but it is one which, I think, must be dealt with before any scheme of re-settlement can be introduced with any prospect of success. After so brief an acquaintance with this province, I do not presume to offer any opinion on the remedy which should be applied; the subject is treated exhaustively in Mr. Logan's special report, and it does not appear to fall within the scope of the question referred for my opinion in G.O., dated 8th August 1883, No. 961, Revenue Department.

Read—the following letter from J. STURROCK, Esq., Collector of South Canara, to the Secretary to the Board of Revenue, dated Mangalore, 27th November 1883, No. 2925:—

I have the honor to submit the following remarks with reference to G.O., dated 8th August 1883, No. 901, Revenue, communicated with Board's Proceedings, dated 28th August 1883, No. 7324.

2. The first point with regard to which my opinion is desired is, "whether in the event of a large portion of Canara having been permanently alienated by the Government ryots at quit-money rents, the unalterable character of these rents *quoad* the Government claim to periodically revise the land revenue can be recognized."

3. The question here is limited to "quit-money rents," but as an agreement permanently fixing the rent in kind may be based on a share of the produce smaller than the Government usually claims as assessment, my remarks will cover all classes of mulgueni leases in the district.

4. As to whether the portion of Canara which has been permanently alienated is large or not, little more than a guess can be hazarded, and with regard to the information furnished to the *Imperial Gazetteer* that not more than one-sixth of the district has been permanently alienated, I can find nothing on record to show that it professed to have any statistical basis. A Collector of the Southern Division of Canara, writing on the 7th August 1801, states: "From every information I have been able to obtain the number of mulguenis in Canara is very small;" while in writing on the 30th April 1802, he only commits himself to the statement that he knows "the tenants at will are three times more numerous than the tenants for ever." There is nothing to show what the increase was during the early years of our administration, but the records of the Registration Department for the years 1871-72 to 1880-81 contain perpetual leases of a gross annual rent-value of Rs. 4,57,241, so that even if we assume that half of these are the counterparts which are usually executed, it appears that property with an annual rent-value of not less than 2¼ lakhs of rupees was permanently alienated on lease during the ten years above referred to. Without attempting any calculation as to the proportion which the lands held on permanent leases bear to the other lands of the district, for which the *data* is really altogether insufficient, I think the above figures indicate that any claims the State may have cannot be waived on the ground of the insignificant portion of the land alienated.

5. Turning now to the question of whether the unalterable character of these rents *quoad* the Government claim to periodically revise the land revenue can be recognized, I have the honor to state that as a revision is to take place, I do not see why mulgueni lands as a whole should *necessarily* be exempted, especially as a rigid rule to that effect would be apt to stimulate the manufacture of fraudulent leases.

6. It having been decided that there is to be a new settlement, I can conceive no better general principle than the Board's proposal to base the "re-settlement of Canara upon existing facts, the outcome of its history," but while the mulgueni leases will no doubt usually indicate the facts as regards rent-value, there are cases in which they will fail to do so. During the ten years preceding 1880-81, premiums to the extent of Rs. 2,60,844 were paid on leases and their counterparts, and it is, as a rule, on mulgueni leases only that premiums of any importance are paid, and in such cases, although the wargdar receives the full value for what he gives, he does not do so in the shape of rent alone, and as frequently only portions of estates are thus given out on mulgueni, it may well happen that the rent reserved is really less than the assessment fairly chargeable on the land. It is true that between premium and rent the lessee pays the full value of the land, but he does not do so more than the outright purchaser or mortgagee for whose capital outlay it is not proposed to make any allowance, and I do not see why any distinction should be made. In practice now if a wargdar has reserved mulgueni rent which is less than the assessment, or has sold a piece of his warg, assigning to the purchaser the payment of an inadequate portion of the assessment, and afterwards fails to meet the Government demand, no distinction would be made between the mulguenigar and the purchaser. In both cases the land is liable to be sold free of incumbrances, unless those having an interest in it pay up the full assessment due. Again, mulgueni rents are not unfrequently given on very favorable terms to relatives or dependants, more particularly to children in the case of the land-holders following the "Aliyasantana," or uncle to nephew rule of succession, and in such cases, the rent paid in no way indicates the true rent-value of the land.

Paragraph 10, Board's Proceedings, dated 11th November 1882, No. 2747.

7. The conclusion at which I arrive is, therefore, that while the rent paid on mulgueni leases will ordinarily afford the most satisfactory basis for the settlement of the Government demand, provision should, if possible, be made for dealing differently in cases in which there is reason to believe that a premium has been paid on the lease, or that an unduly low rent has been reserved. I say if possible, because if the separation of the classes of mulgueni leases above referred to is to involve an elaborate and expensive valuation and classification of the soil of all lands held on mulgueni tenure, I don't think the results would be commensurate with the trouble and expense of the inquiry, and, except for the stimulus to fraud above alluded to, it might be expedient to adopt the simpler plan of fixing the assessment at 50 *per cent.* all round. If, however, the principle of the proposals I am making below with regard to the revision of the assessment generally be adopted, I think that after a survey has been made, such classification of the mulgueni lands as is required can be effected without difficulty.

8. The Board's opinion that it would not be equitable to permit the landlord to transfer to his tenant any part of the increased burden of taxation which the Government may resolve to impose upon him, seems to me to be correct in principle; but if an assessment is fixed in excess of the whole rent reserved, the wargdar might be empowered by law to raise the rent up to the amount of the assessment, so as to save the reversionary and other rights which usually find a place in mulgueni leases. Much may be said in favor of limiting this proposal to cases in which the rent reserved *plus* the annual interest on the premium paid does not equal the new assessment, but as the capital outlay of the purchaser and mortgagee is to receive no special consideration, that of the mulguenigar may be placed on the same footing.

Paragraph 1, Board's Proceedings, dated 11th November 1882, No. 2747.

9. The second question for consideration is whether the principles recently approved by the Government of India for the revision of the land assessment in Northern India are applicable to Canara.

10. In paragraph 16 of Mr. Buck's letter, dated 9th May 1883, No. 525 R., in which the principles referred to are laid down, districts are divided into three classes. From the papers recorded with Board's Proceedings, dated 11th November 1882, No. 2747, and correspondence quoted therein, there is no doubt that Canara falls into the third class, viz., "those in which no estimate of the revenues can be made without a re-survey and revision of the record."

11. A survey being made, then, in the words of paragraph 16 of the same letter, "the first step to be taken would be to determine for each estate the initial assessment which must be the basis of all future assessments. The question at once arises whether we should accept as our initial assessments the present revenues, or whether we should revise them. His Excellency in Council is decidedly of opinion that the present revenues may be accepted in all estates in which the existing revenue bears a fairly adequate proportion to the assets. We have in that case to consider, in what way we can, without a difficult inquiry, distinguish between those estates in which the present revenue can, and those in which it cannot, be accepted as the initial assessment."

12. As regards Canara, it can, I think, be said that in a large number, probably in a majority of estates, the existing revenue bears a fairly adequate proportion to the assets, and the problem is, how to distinguish those estates from the others. This cannot be done without a certain amount of inquiry; and in deciding on the nature of that inquiry, I should accept the view expressed by the Government of India* that the main object of the revision of maps and records should not, as heretofore, be that of effecting an elaborate valuation of land. From paragraph 10 of their Proceedings, dated 11th November 1882, No. 2747, it is clear that the Board agree with me in this, and they proceed to make proposals on this principle for the settlement of the lands held on mulgueni tenure. I trust that it may be found possible to apply the

* Paragraph 19 of Mr. Buck's letter.

principle to all the lands of the district, so far at least as to save the proprietors from such minute and far reaching charges as were considered necessary in revising the settlement of North Canara.

13. In paragraph 7 of their proceedings above quoted, the Board accept my view that there are now no estates in Canara so heavily assessed as to call for a revision for the purpose of lightening excessive burdens, and state that the question of revision is raised entirely in the interests of Government whether the State gets its fair share of the produce of the land. Equalization of the assessment is therefore not an object to be sought for, though of course, it must necessarily result to some extent from the exercise of care that the enhanced assessments are imposed on those most able to bear them. To attain this end, however, it is not necessary to have any such minute inquiry as is required in a heavily assessed district, such as most of the ryotwar districts of the presidency, where the relief of the over-assessed was one of the main objects of the revision. Given a light assessment such as prevails in South Canara, there is no more call for the equalization of the assessment by reductions, than for a redistribution of incomes from other sources. An inquiry such as that referred to in paragraph 12 of my letter recorded with the Board's Proceedings above quoted, and which in the case of a portion of the Honore Taluk led to a change of some kind, and sometimes to a very considerable change, in almost every estate, with the net result of an increase of revenue of only 4·6 per cent., is clearly not what is wanted when the main object of the revision of the settlement is only to secure for Government a fair share of the produce from such estates as do not now pay it. Obviously every endeavour should be made to attain an object of the kind with the minimum of disturbance of vested interests. As many estates as possible should be left untouched, and in determining the lines on which a selection of estates to be resettled is to be made, due consideration should be given to the fact that some authorities have held that no revision at all is justifiable, and that, as regards a general revision, the Board of Revenue recorded their opinion in 1864 that it was impossible.

Board's Proceedings, dated 8th January 1864, No. 85.

14. With regard to the procedure to be adopted for the elimination of the estates to be left alone, although this district is one in which the landlord's income depends chiefly upon rents,* and therefore one in which the acknowledged rent ought to form a factor in the calculation on which the assessment is to be based, yet the estates are so small, the tenants so numerous, and the statistics so defective, that I think a method of classification which would not involve an examination of rents should be adopted in the first instance,—rents being referred to only when a more minute investigation is found to be desirable.

* Paragraph 19 of Mr. Buck's letter.

15. With Board's Proceedings, dated 14th August 1863, No. 5087, there is recorded a letter from Mr. Webster giving certain rates of assessment, which were adopted after considerable discussion, for assessing concealed cultivation and land newly taken up on darkhast. These rates are—

	Coast.			Interior.		
	RS.	A.	P.	RS.	A.	P.
Bail or first sort of rice-land, per acre ...	6	0	0	4	0	0
Majal or 2nd sort, ,, ,, ...	4	0	0	3	0	0
Bett or 3rd sort, ,, ,, ...	2	0	0	1	0	0
Kakkal or grass, ,, ,, ...	0	8	0	0	4	0
Bagayet or garden land, first sort ...	12	0	0	12	0	0
Do. do. second sort ...	8	0	0	8	0	0

16. The garden assessment is only applied when the land is specially adapted for garden, cocoanut and areca-nut gardens on ordinary rice land being assessed at the rice-rates, and the Kakkal rate is applied only to casual temporary cultivation, nothing lower than Re. 1 per acre being in force with regard to what is known as "Warg" (estate) land. These rates are now perfectly well known throughout the district, and are generally admitted to be fair; the classification into byle, majal, bett and bagayet is very simple, and is universally adopted by the people in their own

transactions, and as a first step after the survey, I think the simplest plan would be to classify the land as above, see what the assessment at the rates quoted would amount to, and at once exclude from revision all estates in which the amount thus arrived at was not more than the present assessment *plus* 25 per cent. With regard to the remaining estates, I would deduct 25 per cent. of the present assessment, so as to place them on a par in that respect with the excluded estates, and then offer the holders the option of accepting the remainder as their assessment, or submitting such evidence as would satisfy the assessing officer that an assessment based on 50 per cent. of the *bonâ fide* mulgeni rents and 40 per cent. of the customary chalgeni rents, would amount to a lower figure, which would in that case be adopted. I take 40 per cent. of the chalgeni rents, as a large amount of the new assessment will be imposed on account of land brought under cultivation, or at any rate restored to cultivation, since the date of the imposition of the present assessment, the cost of the improvement having been mainly borne by the landlord, such cost in this district being notoriously very heavy.* It is also to be borne in mind that many of the rates are as high as on irrigated lands elsewhere, without Government having to be at the expense of supplying the water or running the risk of remissions.

* In a country so rocky and uneven, where cattle are not only scarce, but even where they are to be had cannot always be employed, where every spot before it can be cultivated must be levelled with great labor by the hand of man, the expense of the first preparation of waste ground must have been so great that it never could have been attempted unless the assessment had been extremely moderate; and even after land has been brought into cultivation, if it is neglected for a few years, it is soon broken up by deep gullies formed by the torrents which fall during the monsoon.—*Sir Thomas Munro's Report, dated 31st May 1800.*

17. It may be thought that the above proposals are unduly liberal, but they do not exceed in liberality the final proposals of the much-quoted advocate of revision, Mr. Blane, whose matured opinion was that only cases of manifest fraud or encroachment should be touched, and with regard to these, he wrote in paragraph 11 of his minute of the 25th March 1851, recorded as a member of the Board of Revenue—

"As an act of indulgence and in consideration of long tenure, I would in no such cases impose more than a very light additional assessment, and with this view, I would lay it down as a rule, that additional assessment should not be imposed where it already amounts to one-fifth of the gross produce of the estate."

18. I would also earnestly ask for attention to one of the concluding paragraphs of that report of Mr. Blane's on which so much stress was laid when the settlement of North Canara was decided on†:—

† Mr. Blane's report, dated 20th September 1848, paragraph 102.

"If there be anything contained in this report—as I fear there may be—tending to the inference that I am an advocate for a high assessment, I am desirous, before concluding, of most earnestly disclaiming it. No one who has served in so many of the districts of this Presidency as I have can, on coming to Canara, fail to observe and appreciate the blessings of a light assessment and an indulgent settlement. Though it may appear a paradox, it may, nevertheless, I think, be assumed that the very ignorance which I have endeavored to show has ever existed, and still continues in regard to the resources of the country, has in no small degree contributed to the rapid increase of its prosperity which is now so apparent, for no one can doubt that the energies of the people are more likely to be stimulated by the prospect of enjoying the full and entire profits of their exertions, than where these have to be shared with the Government, in however moderate a proportion. As little can it be doubted that, with the ideas which prevailed thirty or forty years ago as to the share of the produce which the Government might fairly exact, no such liberal settlement as would now be deemed politic and just would at that time have been accorded, and the consequence would have been that the advancement of cultivation and general improvement would have been retarded. This, indeed, is apparent from the rates which are now in force regarding the apportionment of the estimated produce in newly-occupied lands, by which one-third of the gross produce is assumed as the Government share, and by the high rate put upon all new land taken up for garden cultivation. Could these rates really have been exacted, I am under the fullest persuasion that little increase in cultivation would actually have taken place; and we might have the example in Canara, as in other parts of the country, of thousands of our laboring population leaving their homes to seek employment in foreign countries, in place of finding an ample demand for their labor at home, as they now do in Canara."

19. In the remarks above made, I have only submitted very general proposals, as details cannot be satisfactorily arrived at until a survey of a portion of the district has been made. At present, I have not even approximately accurate measurements of the cultivated area of a single village except Kolatúr, in the Kásaragód Taluk, which was recently surveyed in connection with the kumari suit now pending. In that village, only seven out of thirty-three estates would escape revision under the proposals given above, the village being situated in one of those parts of the Kásaragód Taluk which I have already reported to be believed to be very lightly assessed. If the Board think it worth while, I can go to Kolatúr and work out my proposals in detail with regard to that village. Its present assessment (exclusive of kumari) is only Rs. 389, and I have enough before me to leave no room for doubt in my mind that a revision on the plan above sketched would lead to the assessment being raised to over Rs. 1,200. As I have just said, however, this cannot be taken as a representative village, and I allude to it merely because it is the only one with regard to which I have any definite statistical *data*.

Paragraph 13 of my letter with Board's Proceedings, dated 11th November 1882, No. 2747.

20. The question of the protection of the tenant, referred to in paragraph 32 of Mr. Buck's letter, is a large and very difficult one. I am not at present in a position to submit any definite proposals on the point, and it would immensely facilitate my study of the subject if I could be allowed to see the report of the Special Commission of 1881-82 on the Land Tenures of Malabar, alluded to in paragraph 7 of the Resolution of the Government of India.

21. Rack-renting is not so common in this district as it seems to be in Malabar, but it is, I believe, on the increase; and as the practice is quite foreign to the ancient system prevailing in the district, which regulated the tenant's as well as the landlord's right, I do not see why something of the kind should not be done now-a-days. It was not the tenant, but the laborer, that was oppressed under the old Hindu systems, and, so far as this district is concerned, the laborer has now pretty well learned that if he is not satisfied with his treatment on the estate on which he has been bred, he can better himself by seeking for higher wages elsewhere, and he usually finds them on the coffee estates above the ghâts.

Read—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Secretary to Government, Revenue Department, dated Madras, 3rd December 1883, No. 3129-72:—

I have the honor, in reference to G.O., No. 961, dated 8th August 1883, to submit the following remarks in answer to the 1st and 3rd of the questions propounded by the Government of India at the end of their letter, No. 538-R., dated 15th May 1883.

2. *Question* 1.—"Whether, in the event of a large portion of Canara having been permanently alienated by the Government ryots at quit-money rents, the unalterable character of these rents *quoad* the Government claim to periodically revise the land revenue can be recognised."

This question I must answer, as the Board, in their Proceedings, No. 2747, dated 11th November 1882, answered it, in the negative. There is no *legal* obstacle to the Government's taking the permanent leaseholds of Canara into account as an asset for the determination of the landlord's revenue when revising assessments.

The question is not a question of right but of policy, not a question of what Government might or could do but of what it should do. As a matter of legal right, it would be possible for Government to ignore these permanent leaseholds, however ancient, for this Government, in assessing land, deals only with proprietors not with tenants, but the question for determination is whether, considering their history, it would be wise or politic to do so. The Board have said no, and, so far as ancient tenures are concerned, I entirely agree with them.

3. I must explain what I mean by "ancient" tenures. The revenue history of Canara enables us to divide its permanent leaseholds into two great classes :—

(1) Those created prior to the Tharao or Sarasari Settlement of 1817.
(2) Those created subsequently thereto.

The former I call "ancient," the latter "modern."

4. In the revision of assessments, I would scrupulously respect the former. Many of them are older than history, they have never been affected by any change of dynasty. They were untouched by the Bednore settlement, even the rapacity of Tippoo respected them ; and, though their assessment to the public revenue has been from time to time the subject of speculative discussion during the eighty odd years of British rule, no definite proposal to make them a *direct* source of public revenue has ever been formulated.

5. The Government of India, in paragraph 6 of their letter, question whether justice necessarily demands the exemption of the perpetual leaseholders of Canara from the effects of a revision of the land assessment, and express the opinion that where the assessment of the proprietors was enhanced, it might be just to enable them to recover a portion at least of the increased assessments from their permanent tenants, or that, as an alternative expedient, the permanent leaseholder might, for the purposes of the public revenue, be treated as the Government ryot and independent of his landlord. But, as I have already said, the exemption of the permanent leaseholders from further assessment to the public revenue than is now included in the rents they pay their landlords is a question not of justice but of policy, while in this presidency we deal for revenue purposes not with tenants but with landlords. It may be assumed that, when the tenures were first created, the rent reserved included the share of the public revenue payable on the leasehold, and that the landlord in accepting a fixed rent in perpetuity undertook to relieve his permanent tenant from all responsibility for the land revenue *for ever*.

History tells us that this engagement has been scrupulously observed as between the parties, and that the revisions of assessment that have occurred from time to time affected only the landlords.

6. If the suggestions of the Government of India were to be adopted, legislation would be necessary in the one case to enable the proprietor to pass on to and levy from his tenant any portion of the enhanced assessment imposed upon him, and in the other to protect the proprietor from the equitable claim to relief that the tenant under his engagement with his landlord would assuredly put forward.

7. Considering then their age and long immunity from separate charge to the public revenue, a charge which was practically redeemed under the engagements with the landlords when the tenures were created, I would most strongly deprecate any interference with them, and would, in their case, restrict the Government demand, as already proposed by the Board of Revenue, to half the rents payable to the landlords.

8. In paragraph 7 of their letter, the Government of India admit that the "conclusion might possibly be arrived at that the permanent character of these leases might be respected without great injury to the interests of the State or materially impairing its ability to revise the assessment at a future period." They point out that, according to the *Imperial Gazetteer*, not more than one-sixth of the district has been thus permanently alienated. In the Gazetteer it is stated that the proportion of permanent leases to leases for years is as 1·6.

These permanent leases include both ancient and modern leases, and no account is taken of the lands that have never been alienated at all, but remain in proprietors' hands. It may be safely said therefore that *less* than a sixth of Canara has been permanently alienated, that is to say, taking the occupied area of Canara as estimated at Acres 400,765, less than Acres 67,000 have been alienated on permanent leases, both ancient and modern.

9. There have been up to date enfranchised, that is to say, freed in perpetuity from all liability to future enhancement of revenue, Acres 6,528,666 of inam land in this presidency, on an aggregate quit-rent of Rs. 16,05,425. The area enfranchised is

25·32 per cent. of the area occupied (Acres 25,776,100) excluding zemindaries, and the quit-rent charged on it is 15·57 per cent. of its full assessment of Rs. 1,03,06,652. I do not know what proportion the rents of the permanent leases bear to the assessment of the occupied lands of Canara, but the area of them is less than 16⅔ per cent. of the occupied area.

10. With these figures before us, there seems very little ground for refusing to treat the permanent leases of Canara with liberality, and they may, I think, be well treated as inams granted by proprietors, the half rents which under the contemplated settlement it is proposed to take from the landlords being regarded as the Government quit-rent imposed in redemption of the right to resume, that is, to assess in full.

11. The case of the recent tenures, that is, tenures created subsequent to the *Tharao* settlement of 1817, is quit different. In the puttahs issued under that settlement, it was distinctly notified that the measure was merely a temporary expedient that was to remain in force only till a permanent assessment was fixed. Any permanent alienations of revenue since that settlement may, therefore, be ignored, and this probably without the slightest risk of injury to any one, for it may reasonably be assumed that, in the face of a notice like this, the landlords would take care to protect themselves against any possible increase of assessment by express stipulations in the leases. The lands included in these recent tenures may, with perfect propriety, therefore be brought into the landlord's assets for the revision of assessments.

12. *Question* 3.—"Whether the principles recently approved by this Government for regulating the revision of the land assessment in Northern India are applicable to the case of Malabar and Canara."

This question appears to be sufficiently answered in this Government's letter to the Government of India, No. 976, dated 13th August 1883, recorded in G. O., No. 975, dated 13th August 1883.

Copy submitted to the Board of Revenue.

(Signed) W. WILSON,
Director of Revenue Settlement,
and Agriculture.

Resolution—dated 20th March 1884, No. 1002.

In their order *, embodied in the Board's Proceedings read above, Government, in communicating a letter from the Government of India, requested an expression of opinion by the Collectors of Malabar and South Canara, the Director of Revenue Settlement and the Board, upon the following questions referred by the Supreme Government:—

* G.O., dated 8th August 1883, No. 961.

(1) Whether in the event of a large portion of South Canara having been permanently alienated at quit-money rents, the unalterable character of these rents *quoad* the Government claim to periodically revise the land revenue can be recognized?

(2) Whether the principles recently approved by the Government of India for regulating the revision of land assessment in Northern India are applicable to the case of Malabar and Canara?

2. With regard to the first of these questions, the Collector of Malabar writes that in this connexion the relations between landlord and tenant must come under consideration, and that any attempt to formulate a scheme of settlement which does not deal with this aspect of the question must necessarily fail. Mr. Galton states that in Malabar the tenant, in the large majority of cases, has no occupancy right, and that at present the landlord cannot be prevented from passing on to his tenant any increase in the Government demand. From this it may be inferred that, as regards Malabar, the answer to the question asked by the Government of India must, in the Collector's opinion, be in the negative.

3. The question of legislating upon the subject of the relation between landlord and tenant in this district is now under the consideration of a committee appointed for the purpose, and upon receipt of their report, Government will doubtless be in a position to decide whether legislation is necessary, and if so, what form it should take.

4. In regard to the second question the Collector says that when a survey and regular settlement of a district have once been carried out, the principles enunciated by the Government of India for regulating future revision may be adopted in Malabar. These principles * are that increase of assessment be permitted hereafter only on the following grounds:—

(1) Increase of area under cultivation.
(2) Rise in prices.
(3) Increase in produce due to improvements effected at Government expense.

* Letter from Government of India to North-Western Provinces, dated 9th May 1883, No. 525 R., paragraph 13. In G.O., dated 8th August 1883, No. 961.

5. Replying to the first question, the Collector of South Canara, after expressing his opinion that there is no ground for laying down a general rule that mulgueni (permanent lease) lands, as a whole, should *necessarily* be exempted from increase in the Government demand since a revision of assessment is to take place, goes on to say that while the rent paid on mulgueni leases will ordinarily afford the most satisfactory basis for the settlement of the Government demand, provision should, if possible, be made for dealing differently with cases in which there is reason to suppose that a premium has been paid on the lease, or that an unduly low rent has been reserved. While admitting the correctness of the Board's opinion that a landlord ought not to be allowed to transfer to his permanent tenant any part of the Government increased demand, Mr. Sturrock would make exceptions to the general rule by allowing a landlord, in cases where the assessment imposed may exceed the whole rent, to enhance the rent up to the limit of the assessment charged.

6. As to whether or not a large portion of the district has been thus permanently alienated, the Collector is unable to give a decided opinion. He traverses as having no statistical basis the statement in the *Imperial Gazetteer* that no more than one-sixth part of the district has been thus alienated; and, while explaining that very little is known on the subject, he expresses his own opinion that the area involved is not inconsiderable.

7. To the second question put by the Government of India, Mr. Sturrock does not give a very direct answer, but he suggests certain principles for adoption in revising the settlement at the present time. The effect of his proposals he is unable to forecast with accuracy, but he explains in detail the procedure which he would recommend. Speaking generally, the principle which he would adopt is to ascertain the area of holdings, at present quite unknown, and to assess it at the acreage rates which have long been fixed for land newly taken up for cultivation, making a liberal allowance.

8. The Director of Revenue Settlement having answered the first question in the negative, so far as the legal right of Government is concerned, proceeds to divide into two classes the so-called permanent leaseholder of Canara:—

(*a*) Those created prior to the Tharow (sarasari) settlement of 1817 (ancient), and
(*b*) Those created since that date (modern).

In regard to the first class, the Director would strictly limit the Government demand to half the landlord's rent; but in dealing with the second class, he would disregard the permanency of the lease because, at the settlement of 1817, due notice was given that that settlement was only provisional, and the landlords may well be supposed to have taken care of their own interests in making agreements with their tenants. The recommendation in regard to the ancient leases is, of course, based upon the assumption that the Government demand is payable by the landlord, not by the tenant.

9. Mr. Wilson considers that the second question has been answered by the Government of Madras in their letter, dated 13th August 1883, No. 976.

10. The result of the inquiries made seems to be that there is no sufficient ground for supposing that a large portion of Canara has been permanently alienated on quit-money rents in such a manner and at such a time as to render the character of these rents unalterable, *quoad* the Government claim periodically to revise the land revenue, and this conclusion applies with at least equal force to Malabar. In regard to the second question, the Board concur with the Director that it has already been answered in the letter from this Government to which he refers.

11. In connection with the subject generally, the Board beg leave to refer to their Proceedings, dated 11th November 1882, No. 2747, and 13th November 1882, No. 2755.

(True Copies and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Director of Revenue Settlement and Agriculture.
" " Collector of Malabar.
" " " of South Canara.

ORDER—dated 16th July 1884, No. 859, Revenue.

Land Revenue, No. 101.

In their letter embodied in the first of the papers read above, the Government of India comment on the suggestion made by the Board of Revenue with respect to the resettlement of the districts of South Canara and Malabar, that it should be based on the principle that, in the case of perpetual lease-holds, the fixed character of the rent reserved should be respected, and that the liability to meet an enhanced revenue demand should be imposed solely on the superior holder, the demand being limited to one-half of the actual rent which the latter receives. They point out that the perpetual tenure-holders can have no right as against the Government to hold at an unalterable quit-rent, inasmuch as the superior holder who created the tenure had no power to impose a limit on the Government demand, and that the expedient suggested is calculated to give rise to future complications besides involving an excessive sacrifice of revenue. Adverting, at the same time, to the unprotected condition of the tenants in Malabar as described in a recent report of a Special Commissioner, the Government of India ask for an expression of the opinion of this Government on three questions categorically propounded as follows:—

(1) Whether, in the event of a large portion of Canara having been permanently alienated by the Government ryots at quit-money rents, the unalterable character of these rents, *quoad* the Government claim to periodically revise the land revenue, can be recognised.

(2) Whether the condition of the actual cultivators of the soil in Malabar is such as to call for special remedies.

(3) Whether the principles recently approved by this Government for regulating the revision of the land assessment in Northern India are applicable to the case of Malabar and Canara.

2. The Board's proposals having at the same time attracted the attention of Her Majesty's Secretary of State, Lord Kimberley in his despatch of the 13th December last also desires to be informed of the views of this Government, pointing out, with reference to the mulgueni (perpetual) lease-hold tenure of South Canara, that the view taken by the Board is at variance with the opinion expressed by the Chief Justice in the case of

Vaikuntha Bapuji *v.* The Government of Bombay, and that the mode of settlement recommended by them practically concedes the principle of a permanent settlement which, by the Board's own showing, has never been extended to this district; involves a divergence of practice between this district and North Canara, where the same tenure prevails but no such principle is conceded, and places the superior holders, the wargdars, in a less advantageous position compared with their tenants, inasmuch as the Board do not propose to assess equally lightly lands retained by the wargdars in their own occupancy, nor to declare the assessment on those lands unalterable for the future.

3. The Board's Proceedings of the 20th March, the last of the papers read above, embody the reports of the Collectors of South Canara and Malabar, the Director of Revenue Settlement and their own, which the Government called for on the questions above noticed.

4. It is to be observed that in Proceedings, dated 18th April 1883, No. 459, the Government recorded their conclusion that there was nothing in the revenue history of these districts to give the existing settlements an unalterable character, and that the Government were free to revise them—a measure which, in justice to the revenue-payers in the rest of the presidency, is obviously called for. They did not then consider it necessary to pronounce an opinion on the Board's specific proposals as to the terms on which the settlements should be revised, as this question, which is doubtless surrounded with difficulties, would come under full discussion when the time came to give effect to the general measure of revision resolved upon. On careful consideration, however, of the previous correspondence on the subject, as well as the further information now placed before him, the Right Honorable the Governor in Council has no hesitation in rejecting the proposition that a right to hold at unalterable money rents should be recognised in the perpetual tenure-holders of South Canara and Malabar, and that in the case of lands held on such tenure, the future revenue demand should be restricted to one-half of the rents now paid. Indeed, he observes, the Board have now tacitly withdrawn the recommendation made by them to the effect above specified.

5. There appears to be no essential difference as to the basis of the Government revenue in Malabar and South Canara and in other districts, such as to make the ordinary settlement principle of taking a portion of the net produce as the Government share inapplicable. In Malabar* the Government revenue is a share of the pattam, or surplus after deducting the cultivator's share; and in Canara† the proprietor and the State originally divided this surplus equally. The question is obscured by the use of the term *rent* to designate the surplus; and there is no reason why the settlements in these districts should be made upon rents and not upon produce. All such notions must, therefore, be set aside. How far the present assessment falls short of half the net and to what extent it may be expedient or possible to raise it towards that limit are questions which cannot be even considered until settlement enquiries shall be far advanced. But, as at present advised, the Government see no reason to believe that it will be necessary to depart from the usual principles, or in any serious degree from the usual methods, of revision of settlement.

* Paragraph 10 of Board's Proceedings, dated 13th November 1882, No. 2755, in G.O., dated 18th April 1883, No. 459.

† Bombay High Court's judgment in the Canara case, page 80.

6. In the papers before Government, there is very little of statistical fact as to the extent of land held on mulgueni tenure, and as to the general relation between the amount of the mulgueni rents in Canara and the revenue assessment. Mr. Wilson assumes that the rents are generally the lower of the two, so much so as to warrant the treatment of mulgueni tenure as inams. But there appears to be no ground for this assumption; on the contrary, the Collector in paragraph 6 of his letter seems to imply that cases of this sort are, though not rare, exceptional, and, from his statement in paragraph 7, the Government gather that he considers the proposed 50 per cent. of the mulgueni rents as satisfactory an approximation as can be made to the half net produ

which, under recognized principles of settlement, is to be taken as the Government share. The average rates of mulgueni rents are given as follows in the *Imperial Gazetteer* :—

	RS. RS.
Byle or 3rd-crop land	20 to 26
Mazal or 2nd-crop land	12 to 16
Bett or 1st-crop land	8 to 11
Cocoa and areca nut gardens	30 to 40

These rates are more than treble those given by Mr. Sturrock as fair rates of assessment in district estimation. It is probable that definite information as to the proportion between the rents and the revenue will not be obtainable before settlement operations are in progress; but it is obviously unprofitable to discuss the details of a concession to be made before it is proved that there are grounds for a concession at all.

7. The foregoing observations dispose of the first of the questions asked in the Government of India letter. The answer is a decided negative.

8. On the second question, which refers to the condition of tenants in Malabar, the Government are at present unable to give a decided opinion, as Mr. Logan's report on the subject is still before the Committee appointed to report thereon, and it cannot be determined until the Committee's report has been received and considered by the Government whether special remedial measures should be provided by legislation or not.

9. On the third question, viz., whether the principles approved for regulating the revision of assessment in Northern India are applicable to South Canara and Malabar, the Government in their reply to the Government of India, dated 13th August 1883, No. 975, have already expressed the opinion that, in unsettled districts to which class these two belong, the *first* revision of assessment cannot be made with reference to prices alone. In the present unsatisfactory position of affairs, a regular classification and valuation of land is obviously an essential preliminary to the fixing of an initial revenue which shall form the basis of future revisions depending only on a readjustment of commutation rates.

10. His Excellency in Council fully recognises the necessity of fixing the initial revenue with the least possible disturbance of vested rights; but he is at present unable, on the information before him, to give his approval to the plan proposed by the Collector of South Canara or to any other definite plan. The specific method of treatment for each class of cases must be determined when the time comes for introducing the survey assessment, and must be based on careful local enquiry preceded by a regular classification and survey. Further, in this district areas are altogether unknown, and it is hardly possible to form an opinion as to the adequacy or inadequacy of the rents reserved before the areas have been accurately ascertained by survey.

11. It remains to notice the suggestion of the Director of Revenue Settlement that the lease-holds created prior to the *tharâo* (average) settlement of 1817 should be scrupulously respected. The Government are unable to understand the principle on which Mr. Wilson draws a line between lease-holds created prior and subsequent to the date of the settlement referred to. The *tharâo* settlement did not concede a tenure at invariable rents to the then existing mulgueni lease-holds; nor were these lease-holds excepted from the terms of the puttahs issued under that settlement in which it was notified that "the measure was merely a temporary expedient that was to remain in force only till a permanent assessment was fixed." Mr. Wilson's argument takes it for granted that, prior to the *tharâo* settlement, a belief existed that lands held on *mulgueni* leases would not come under a revision of assessment; but the whole revenue history of Canara and of the *tharâo* settlement itself shows that such a belief could not have existed before 1817; in fact, so far as can be seen, it is to a great extent of recent growth.

12. The Government do not attach any importance to the general assertion that the mulgueni lease-holds were untouched by the Bednore and Tippu's Governments, since Mr. Wilson quotes no authority in support of it. It is everywhere admitted * that those Governments successively enhanced the land assessment in Canara, and it is shown that they spared lands let on mulgueni leases. If these tenures survived it

* Bombay High Court's judgment in the case of Vaikuntha Bapuji *v.* The Government of Bombay, pages 81—86.

must have been either because the rents were still greater than even the enhanced assessments, or because the *wargdars*, who were compelled to pay an enhanced revenue, in their turn levied enhanced rents from their tenants.

13. Mr. Wilson's impression as to the small amount of fiscal sacrifice involved in his proposal is based on the statement in the *Imperial Gazetteer* that not more than one-sixth of the district has been permanently alienated; but the report before Government shows that this statement has no statistical basis, and that the area covered by these perpetual tenures is, in the opinion of the present Collector, not inconsiderable.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
" Director of Revenue Settlement and Agriculture.

Exd. J. Henricus.

120 Copies.

Inw No. 2307/84

Gobt. of (1884) Madras.

REVENUE.

18

No. 2601/146

…icated to the Officers in charge of Settlement Parties.

…of Rev. Sett. & Agre. …as 15 August 1884 (By order)

[signature] 1st Assistant

The Dy: Director Party No. III

Issued

Recd.

Encl.

G.O., 16th July 1884, No. 859.

JULY.

Settlement of Malabar and South Canara.

Certain questions raised in connection with the —, discussed, and the views of the Government recorded.

-8-82. cc/ 44 44

Refd Indo

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from J. NUGENT, Esq., Secretary to the Government of Bombay, to the Secretary to the Government of India, Revenue and Agricultural Department, dated 7th June 1884, No. 4607:—

I am directed to forward herewith, for the information of the Government of India, copies of a letter No. L-4, dated 27th March 1884, from Mr. H. F. Hatch, Special Assistant Collector and Settlement Officer, Ratnágiri, containing some interesting notes on the natural history of the locust (*Acridium peregrinum*).

ENCLOSURES.

From G. H. D. WILSON, Esq., Collector of Ratnágiri, to the Commissioner, Southern Division, Poona, dated Kurna, 22nd April 1884, No. 2221.

Forwarding Mr. Hatch's report on the natural history of the locust (*Acridium peregrinum*).

I have the honor to forward herewith a very interesting report from Mr. Hatch on the natural history of the migratory red locusts.

2. It will be remembered Mr. Hatch had in his No. L-18 of 3rd September 1883 promised us a similar report, but in his No. L-74 of 8th December last, he said that he had very little to add to his No. L-18. In submitting his present letter he has redeemed his former promise for which he deserves credit.

3. A great part of his remarks have been already recorded by me independently in my No. 1098 of 19th February 1884.

Endorsement on the above by J. G. MOORE, Esq., Acting Commissioner, Southern Division, dated Poona, 20th May 1884, No. 1883.

No. 2188, dated 2nd May 1884, Locusts.

Forwarded for the information of Government in continuation of this office No. 1041, dated 11th March last.

2. Mr. Hatch's industry in making experiments on locusts is very creditable to him.

From H. F. HATCH, Esq., Special Assistant Collector and Settlement Officer, to the Collector of Ratnágiri, dated Daywdhay, 27th March 1884, No. L-4.

I have the honor to submit, for the information of Government, as requested, the following notes on the natural history of the locust (*Acridium peregrinum*):—

In the Konkan the locusts coupled in great numbers between the 15th May and the 15th June 1883, and died off naturally immediately after the eggs had been deposited. The eggs are deposited mostly in flat and gently sloping warkas land of soft friable soil; rocky and sandy soil being avoided, and land which has been ploughed up and the lee-side of the balks, where the soil has accumulated, are mostly selected. The eggs are piled in a small cylindrical hole, parallel to its sides, and are attached to one another by some cohesive siccable substance. Filling the mouth of the hole is a plug, consisting of a soft fibrous substance and below it the eggs arranged, as described, averaging 70 in each hole. The holes are from 1·5 to 2 inches in depth, and in a good locality four might be found in a span. They are not easily visible, but when one is found others are generally near it. Brushing off the loose dust and digging here and there facilitates search.

2. The eggs themselves are of a dirty ochre colour, in length ·2 to ·3 and in diameter ·05 to ·08 of an inch, rounded in section, with a slight curve and tapering very slightly towards the rounded ends.

The sketch along side shows an egg of ·2 length and ·05 diameter, dimensions magnified five times. When fresh, the contents of the eggs are of a dirty orange colour, liquid but slightly viscous, with a somewhat acrid taste. The envelope apparently consists of two layers, the outer one coloured and tough, and the inner one white and fragile. When broken the eggs give off an odour like a broken root. As the eggs approach maturity, they assume, a distinctly greenish hue, and the young locust bursts the shell down the middle on issuing into life.

I experimented on some eggs by placing them in damp and very damp soil, but the water did not affect the hatching.

The young locusts appeared in myriads in my district (Chiplun táluka) between the 1st and 20th August, so that the period the eggs required to hatch was a little more than two months —say 70 days.

3. The young locusts vary somewhat in colour, most being a dullish light-green, some light-green but hardly verdant, and a few almost white and only tinged with green. They, a few minutes after hatching, are strong enough to jump and are as perfect insects as at any time up to the winged stage. The antennæ are darksome and short, whilst on the thigh-cases small black spots, and on the upper side of the abdomen a faint black line, are just visible. The black line and the black spots are, I consider, the diagnostic marks, although I see that the Secretary and Curator of the Victoria and Albert Museum in his No. 569 of 1883 talks of a dark streak below the eye as existing from the earliest stage; I did not observe it until the initiatory winged stage. Their length is about ·4 of an inch.

4. The young locusts generally cast their slough for the first time about 15 days after birth, and in their new skin the black line and spots become darker and the green colour of a deeper hue. They now leave the grass land and seek the shelter of the crops, and are in length ·8 of an inch.

5. After another interval of 15 days they again cast their slough and enter on the third stage. In this the black line becomes very intense as also do the spots which lengthen and form the so-called Koranic verses—they do show a certain similitude to some letters of the Arabic alphabet اجن. They are now 1·2 of an inch in length.

6. They enter the fourth stage by casting their slough after another 15 days, and assume, including the antennæ, a yellow colour which, towards the end of the stage, becomes pinkish-grey. The black line and the Koranic verses are now very intense in colour and the insect attains the length of 1·6 of an inch.

7. A great transformation is witnessed on entry into the fifth stage after 15 more days. The female is now 2 inches long, whilst the male is somewhat less. The colour of the head, prothorox and abdomen is a grey or drab, speckled on the prothorox and darker along the upper side of the abdomen. The ringed antennæ are a deep yellow, the eyes chesnut and striated, whilst for the first time appears an oblong mark under each eye, indigo-green in colour, and bordered on each side by yellow. The Arabic letters have now disappeared, whilst the spots on the thigh-cases are obsolescent. The young wings, too, now first appear. At first very small, they grow during the period of this stage—20 days. The contents of the wing-sprouts is at first liquid, and the young wings may be seen forming within the semi-transparency. When they are fully formed the insect is of a dark-brownish grey colour, whilst on the prothorox and elsewhere may be distinguished the colouring of the next stage.

8. In its sixth and perfect stage the insect presents a brilliant appearance. The female is now 3 inches and the male 2½ inches in whole length from head to tips of wings, which overlap the abdomen by ·5 of an inch, and are rounded. On casting the slough the wings dry and unfold, and the body of the insect, at first soft and moist, gradually hardens in the sun. The antennæ are 8 inches in length and of a bright yellow colour, the head is a brownish yellow, and the eyes, finely striated, are of a deep chesnut. The prothorox is alternately banded with a bright yellow and a rich brown, parallelwise to the body, and the legs are of an ochrish hue. Along the upper rim of the femur runs a deep brown stripe and the knee-caps are of the same colour. The tibia, tarsus, and foot are a bright ochre, and the first is armed with 8 black-tipped spurs on the outside and 11 on the inside, while there are a pair of spurs on each side of the ankle-joint and on each side of the foot. The outer wings or wing-cases have the colours on the prothorox extended to them, and on the back they form a flat surface, tapering to the extremity. They are strongly veined and finely reticulated and towards the extremities are irregularly brown-marked. The inner wings which are expansive are hardly coloured. The abdomen is a light-brown, darker along the ridge, and in the female there are four spiky processes at its extremity, the upper pair curling up and the lower pair downwards. In the male the lower pair is replaced by one spiky process larger and stronger.

9. The locust now packs with its kindred, and they form the swamps which ravage the country. After a month or so, they assume a red tinge, which gradually deepens and continues until their death, which takes place after the sexual function has been performed in May—June. The proportion of males to females appeared to me about 1 in 6.

10. The whole life of the insect, including the egg-period, is exactly one year.

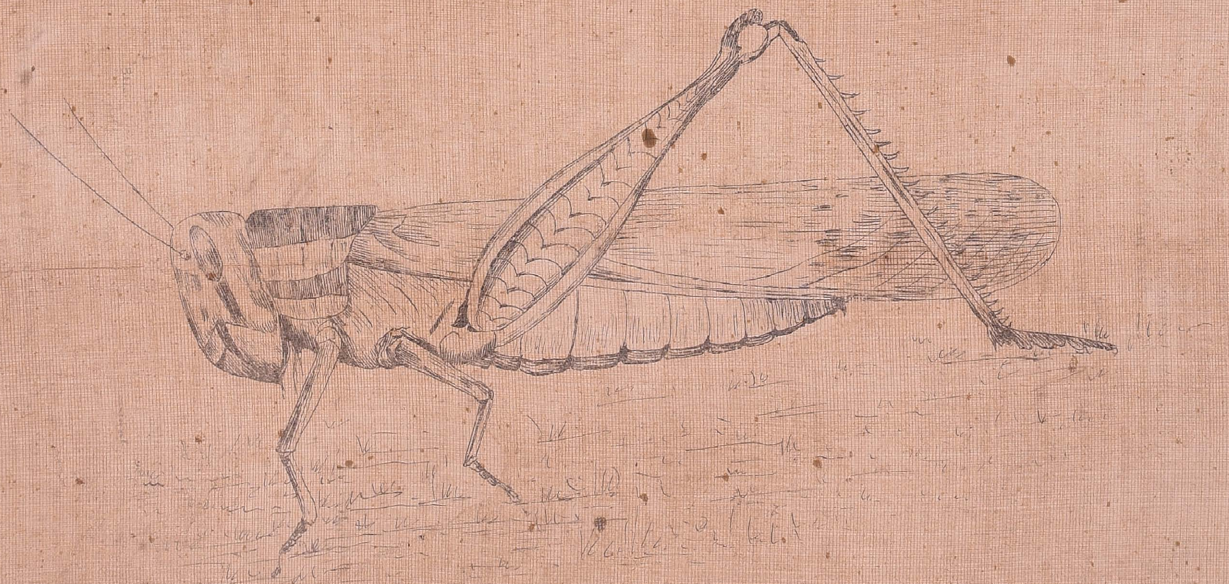
11 The accompanying pencil sketch is that of a full-grown female insect twice the size of life.

45

Accompaniment to Report on Locusts.

No. L-4.

Female perfect insect (*Acridium peregrinum*) twice the size of life.



H. F. HATCH,
Spl. Asst. Collr. and Set. Officer.

Ratnágiri Districts.

Circular No. 75—4-11 (Famine).

Copy, with three spare copies, forwarded to the Government of Madras for information in continuation of the endorsement from this department, Circular No. 66 F., of the 6th instant.

(By Order.)

REV. AND AGL. DEPT.,
SIMLA, 24th June 1884.

(Signed) T. W. HOLDERNESS,
Under Secy. to the Govt. of India.

ORDER—dated 12th July 1884, No. 836, Revenue.

Miscellaneous.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.
,, Superintendent, Government Central Museum.

No 1749

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle diseases.

Dept. of Rev. Sett. & Agre.
Madras 4 August 1884

(By order)

[signature]
1st Assistant

To.

Exd. J. Henricus.

The Dy Director No III party

80 copies.

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 12th July 1884, No. 836.

JULY.

Locust (Acridium peregrinum).

Copy of notes by Mr. H. F. Hatch, Special Assistant Collector and Settlement Officer, Ratnágiri, on the natural history of the —, communicated to the Board of Revenue and Director of Revenue Settlement and Agriculture.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 11th June 1884, No. $\frac{1987}{\text{Forest 142}}$:—

Read—the following letter from Major J. CAMPBELL WALKER, Conservator of Forests, Southern Circle, to the Secretary to the Board of Revenue, dated Ootacamund, 21st May 1884, No. 470 :—

Referring to Board's Proceedings, No. $\frac{1010}{\text{Forest 37}}$, dated 20th March, regarding the experimental planting of *Ipecacuanha* and the suggested establishment of a forcing-house and nursery at Calicut, I have the honor to report that, after consulting Mr. Lawson and the District Forest officer, Wynaad and Pálghat, I am of opinion that it will suffice to send two dozen plants to Mr. T. J. Ferguson, Calicut, two dozen to the Forest Ranger, Pálghat, and two dozen to the Sub-Assistant Conservator, Manantoddy, for experiment, in accordance with Mr. Lawson's instructions and under the District Forest officer's supervision. The District Forest officer, Nilambúr, has already a supply of plants for experiment, but has been asked if he requires more, which, Mr. Lawson informs me, can be supplied.

2. Experiments on a somewhat larger scale were originally contemplated, but Mr. Lawson deprecates their necessity, and it will be observed, from the concluding paragraph of his letter printed with the Proceedings under reference, does not think the cultivation of *Ipecacuanha* "will ever become a branch of forestry proper," an opinion in which I fully concur.

The instructions to be sent will include the necessary information as to the formation of the nurseries and planting out when established.

3. As regards the forcing-house, in a memorandum submitted by Mr. Morgan to the Collector of Malabar he fully explains his reasons for requiring it, not for the propagation of *Ipecacuanha*, but to enable him to strike cuttings of *Castilloa elastica*, which, he states, both Mr. Ferguson and himself have found impossible without bottom heat. Mr. Lawson and I do not consider his arguments conclusive, and as I have recommended, in a separate communication, that the *Castilloa* and *Hevea* experiments be left entirely to Mr. Ferguson, and that he should restrict himself, at present, to *establishing* the plants he has, the matter may well lie over until I, and I hope Mr. Lawson, visit Calicut and confer with Mr. Ferguson and the local officers on the spot.

4. I may state that Mr. Morgan's estimate for a forcing-house at Calicut, 14 feet by 10 feet, with 5 feet walls and corrugated iron roof, amounts to Rs. 252-5-0, and that we have no funds available in our budget.

Should it eventually be decided to build such a house, I would rather have it at Nilambúr, where the Assistant Conservator (Mr. Hadfield), resident on the spot, can give it his personal attention. He informs me that he is, meanwhile, having a glass-frame made for experiments in propagation.

Resolution—dated 11th June 1884, No. $\frac{1987}{\text{Forest } 142}$.

Submitted to Government with reference to G.O., No. 301, dated 6th March 1884.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.

Copy to the Conservator of Forests, Southern Circle.
,, ,, Conservator of Forests, Northern Circle.
,, ,, Collector of Malabar.
,, ,, Deputy Conservator of Forests, in charge of Central Office of Accounts.

ORDER—dated 14th July 1884, No. 838, Revenue.

Forest, No. 105.

The Conservator's proposals are approved.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.
,, ,, Government Cinchona Plantations, Parks and Gardens, Nílgiris.

Exd. J. Henricus.

70 Copies.

48

No. 1736

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle diseases.

Dept. of Rev. Sett. & Agre.
Madras / ~~July~~ August 1884

(By order)

[signature]
Asst. Assistant

To

The Dy Director Party No. III

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 14th July 1884, No. 838.

JULY.

Ipecacuanha

and the establishment of a forcing-house at Calicut.—Forest Conservator's proposals in connection with the experimental planting of —, approved.

16TH JULY 1884, No. 863, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following G.O., dated 15th July 1884, Mis. No. 1572, Financial:—

Read—the following letter from the Government of India, Revenue and Agricultural Department, dated 5th July 1884, No. 284 S:—

Despatch to the Secretary of State, No. 140, dated 12th May 1884.
Telegram from the Secretary of State, dated 24th June 1884.

Referring to your letter to the Finance Department, No. 380, dated the 22nd February last, I am directed to forward a copy of the papers noted in the margin, from which His Excellency the Governor in Council will see that the Secretary of State has sanctioned the proposals of the Madras Government to increase the superior staff of the Madras Survey establishment.

2. I am at the same time to refer to the letter from this department, No. 309, dated the 12th August 1882, paragraph 2, and to inquire whether any officers or subordinates of the Survey of India Department will be required for employment in the Madras Survey Department.

Order—dated 15th July 1884, Mis. No. 1572, Financial.

Communicated to the Revenue Department with reference to Proceedings in that department, No. 63, dated 16th January 1884.

(True Extract.)

(Signed) E. F. WEBSTER,
Chief Secretary.

To the Revenue Department, with original enclosures.

ORDER—dated 16th July 1884, No. 863, Revenue.

Miscellaneous.

Communicated to the Board of Revenue, the Director of Revenue Settlement and Agriculture, and to the Superintendent, Madras Survey, who will report on paragraph 2 of the letter.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
" Director of Revenue Settlement and Agriculture.
" Superintendent of Revenue Survey.
" Accountant-General.

Exd. J. Henricus.

80 Copies.

Govt. of (1884) Madras.

REVENUE.

G.O. 2502/143

Issued

Recd. *Encl.*

G.O., 16th July 1884, No. 863.

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre.
Madras 4th August 1884

(By order)

[signature]
Ist. Assistant

JULY.

To The Dy. Director of Rev. Sett.
Party No. III

Survey Establishment.

Letter from the Government of India intimating that the Secretary of State has sanctioned the proposals to increase the superior staff of the —, communicated to certain authorities.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from Colonel H. T. ROGERS, R.E., Superintendent, Madras Survey, to the Secretary to Government, Revenue Department, dated Ootacamund, 2nd July 1884, No. 137 G. :—

With reference to G.O., dated 3rd June 1884, No. 703, Revenue, I have the honor to bring to notice, with regard to paragraph 4, that the whole of the demarcation of Malabar, Wynaad, with a few inappreciable exceptions, has been completed.

2. Since, however, the land registers, with the exception of those of the amshoms of Ganapativattum and Ellurnad, are not yet completed, I propose to enter in the registers of all the other amshoms the names of the jenmis through whom present occupants claim to hold land, and also the areas of uncultivated land, not demarcated, which native proprietors may state that they are entitled to. The lands, both cultivated and uncultivated, claimed by European proprietors, have been separately demarcated.

Order—dated 15th July 1884, No. 845, Revenue.

Miscellaneous.

The Superintendent's proposals are approved; but, in all cases in which areas have been already demarcated, notice as to the demarcation being merely provisional and dependent on the final settlement of titles, should be at once given as directed in paragraph 2 of G.O., dated 3rd June 1884, No. 703.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Superintendent, Revenue Survey.
,, the Director of Revenue Settlement.
,, the Board of Revenue.

Exd. P. L. Pereira.

70 Copies.

Govt. of {1884} Madras.

REVENUE.

No. 2503/144

Issued

Recd. Encl.

G.O., 15th July 1884, No. 845.

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre. Madras 4th August 1884

(By order)

Sheppard

1st. Assistant

To,

The Dy Director No III party

JULY.

Wynaad Survey.

The proposals of the Superintendent, Madras Survey, regarding the preparation of land registers in connection with —, approved; and that officer informed that, in all cases in which areas have been already demarcated, notices to the effect that the demarcation is only provisional, should be given as directed in the previous order.

24-7-84

4th July 1884, No. 813, Revenue.

Register

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from W. S. WHITESIDE, Esq., Acting Third Member, Board of Revenue, in charge of Revenue Settlement and Agriculture, to the Secretary to Government, Revenue Department, dated Madras, 21st June 1884, No. 2032-57 :—

I have the honor to request the Government will be pleased to sanction the daily allowance of two annas to the servants of this office, under Exception 6, Section 30 of the Civil Travelling Allowance Code, as they have to travel through more than one district.

Order—dated 4th July 1884, No. 813, Revenue.

Miscellaneous.

Sanctioned.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
" the Accountant-General.
" the Board of Revenue.
" the Educational Department.

Exd. W. H. French.

80 Copies.

Gobt. of (1884) Madras.

REVENUE.

No. 2362/134

Communicated to the Officers in charge of Settlement Parties.

Depth. of Rev. Settt. & Agriculture Madras 21st July 1884.

By order
[illegible]
1st Assistant.

To
The Dy Director
No. III Party.

Issued

Recd. Encl.

G.O., 4th July 1884, No. 813.

JULY.

Travelling Allowance Code.

Grant of a daily allowance of two annas under Exception 6, Section 30 of the —, to the servants of the Department of Revenue Settlement and Agriculture, sanctioned.

10th July 1884, No. 882, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 13th June 1884, No. 2034:—

Read—the following letter from W. S. WHITESIDE, Esq., Acting Third Member, Board of Revenue, in charge of Revenue Settlement and Agriculture, Madras, to the Secretary to the Board of Revenue, dated Madras, 19th May 1884, No. 1276:—

With reference to the general plan of exhibition suggested by the Board and approved by Government in G.O., dated 30th January 1884, No. 146, Revenue Department, I have the honor to submit herewith copy of a letter, dated 24th April 1884, No. 290, received from Mr. Benson, the Agricultural Reporter to Government.

2. He thinks that the central exhibition at Madras should be held at intervals of three years, as suggested by the Committee of the last exhibition (paragraph 49 of their report), and that the exhibitions intended for the benefit of the southern districts should be held at one or two places fixedly. He specifies Erode and Madura as eligible localities where the shows may be held in alternate years.

3. According to the programme in Board's Proceedings, dated 7th January 1884, No. 15, the Madras exhibition will be held after an interval of seven years, and the shows intended for the southern districts will be moved each year to a new place. Mr. Benson thinks that long intervals and frequent changes of site will operate to destroy the interest of the people in the shows and render the local experience acquired in their management of little or no use. In this view, he considers it to be an advantage that the shows at Gooty will continue to be held there successively for a number of years.

Board's Proceedings, dated 14th January 1882, No. 92.

4. There is considerable force in Mr. Benson's remarks, and, considering that, under present arrangements, there will be but two exhibitions each year, one for all the northern districts in the presidency and the other for all the southern districts, it certainly seems desirable that the shows should be held fixedly at one or two places, so selected as to be easily accessible from all the districts for whose benefit the shows are intended. Such fixity will secure the attention of the competing public and each succeeding show will furnish an accurate measure of the improvement in local industries effected by its predecessors.

5. I also support Mr. Benson's recommendation that the central exhibitions at Madras should be held at intervals of three years. I observe, however, that no orders have been passed by Government on the recommendation to this effect made by the Committee of the last exhibition at Madras (G.O., dated 7th November 1883, Nos. 1373 and 1373-A).

6. As regards the revival of the cattle shows formerly held at Addanki, referred to in paragraph 6 of Mr. Benson's letter, I am of opinion that it is unnecessary. Agricultural exhibitions will probably be held in Nellore when it is connected by rail with the inland districts, and they will answer all practical purposes for the improvement of the breed of cattle.

Enclosure.

From C. BENSON, Esq., M.R.A.C., Agricultural Reporter to the Government of Madras, to the Director of Revenue Settlement and Agriculture, dated Saidápet, 24th April 1884, No. 290.

In reply to your endorsement on Proceedings, No. 1085, dated 22nd instant, I have the honor first to point out that the Board appear in their Proceedings, No. 15, dated 7th January 1884, to have overlooked the recommendation of the Committee of the late Madras exhibition, that an exhibition should be held in Madras at intervals not exceeding three years. Under the proposals now accepted, there will be an interval of seven years between the exhibitions, and the same want of special experience as was felt at the late exhibition will probably again be met with, and, unless these exhibitions are pretty frequent and so become thoroughly known to the people who are likely to compete, the interest necessary will not be kept up. I therefore venture to urge a reconsideration of this point.

See paragraph 49 of their report.

2. What holds good of Madras in respect to the encouragement of competition is especially applicable to the mofussil, where there is not likely to be as clear an understanding, amongst the competitors, of the aims of such shows. It will take some years for the people to become accustomed to these shows, and therefore if real good is to be done and the shows are to be moved from place to place at all, they must be held every year, or at most every other year, within a certain limited area, perhaps, of several districts, from the whole of which it will be possible for competitors to come with ease.

3. The show at Gooty is, I presume, intended for the Ceded Districts generally, and the fact that it will be a fixture there will be, I believe, a great point in favor of its success; whilst the movements of the show in the southern districts from place to place every year will, I believe, be fatal to the hope of their inducing anything more than the most fleeting interest in their objects.

4. If it be impossible to increase the number of annual exhibitions, it seems to me that it would be preferable to hold that for the southern districts at two places only, alternately, say, at Erode and Madura. These two places would serve several districts, each with ease, and, as regards North Arcot, the local Agricultural Society seems capable and willing to do all that need at present to be done in the district in this direction.

5. What then seems to me to be necessary in the whole scheme is that some continuity should be given to the shows if real good is to be done.

See paragraph 6 of Board's Resolution, No. 92, dated 14th January 1882.

6. It is also a matter deserving of consideration whether the cattle shows formerly held at Addanki should not be revived.

Resolution—dated 13th June 1884, No. 2034.

In June 1881, Mr. Robertson proposed that five agricultural exhibitions should be held annually in different districts, in the years 1883 to 1886, so that, within that period, 20 out of the 21 districts might have had its show, the Madras exhibition being held in the fifth year, 1884. The Board considered the proposal, and in their Proceedings, of 14th January 1882, No. 92, modified it, being of opinion that two district exhibitions annually were enough, one in the northern and the other in the southern districts.

This plan was approved by Government in G.O., No. 257, dated 3rd March 1882, and the Board accordingly called on Collectors to report if good sites existed in their districts. On receipt of the reports so called for, the Board submitted further proposals to Government in their Proceedings, dated 7th January 1884, No. 15, the proposal that a central exhibition should be held at Madras in 1890 being made in accordance with the orders of Government contained in G.O., dated 3rd March 1882, No. 257, Revenue Department, and the places suggested in paragraph 3 of the Board's Proceedings being selected after much consideration.

2. Mr. Benson now suggests that the Board's proposals, which have been approved by Government, should be altered and that the southern districts' show should be held annually at Erode and Madura alternately, and that the central exhibition at Madras should be held every third year. To this latter proposal the Board have no objection if the Government think fit to entertain it, but they think their own plan of

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operations is otherwise to be preferred until a greater number of such exhibitions can be held annually.

3. The Director does not advocate the revival of the Addanki cattle show. The Board concur with him.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
,, Director of Revenue Settlement and Agriculture.

ORDER—dated 10th July 1884, No. 832, Revenue.

Miscellaneous.

The Government are of opinion that a quinquennial exhibition at Madras will be sufficient, three years being too short an interval. The next central exhibition would thus be held in 1888.

2. Before passing orders as to the places in which mofussil exhibitions should be held for the southern districts, the Government desire the Director of Agriculture to ascertain and report the views of the Collectors concerned on the proposed substitution of Erode and Madura for the localities approved in G.O., 30th January 1884, No. 146.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

Exd. P. L. Pereira.

Copies.

No 1918/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

Lo. 1692

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle deseases.

Dept. of Rev. Sett. & Agre.
Madras 24th July 1884

(By order)

[signature]
Ist. Assistant

To,

The Dy Director No III party

G.O., 10th July 1884, No. 832.

JULY.

Agricultural Exhibitions.

Considering that a quinquennial exhibition at Madras will be sufficient, and desiring the Director of Agriculture to report the views of the Collectors concerned on the proposed substitution of Erode and Madura for the localities already approved by Government in which mofussil exhibitions should be held for the southern districts.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from E. C. BUCK, Esq., C.S., Secretary to the Government of India, Revenue and Agricultural Department (Revenue), to the Secretary to the Government of Madras, dated Simla, 15th May 1883, No. 537 R.:—

I am directed by His Excellency the Governor-General in Council to reply to your letter of 31st July last, No. 796, regarding the resurvey and settlement of the Tanjore district.

2. The conclusion of the Government of Madras, as stated in your letter, was that the State is not prevented by any pledges as to the permanency of the present settlement of Tanjore from revising the land-revenue assessment, should the measure be deemed advisable. But it was added that His Excellency the Governor in Council, after a careful consideration of the subject, still adheres to the decision arrived at by Sir Charles Trevelyan's Government in 1860, that the existing settlement should not be disturbed, as it has been attended with results eminently satisfactory as regards the public revenue and the welfare of the people.

3. Meanwhile the question of the survey of the district arose in connection with the department of Public Works, as it appeared that without a survey the information required by the Government of India in support of proposals for the improvement of the irrigation in the Cauvery delta could not be furnished. The deltaic portion of the district, of which a survey for these purposes was required, comprises an area of 2,430 square miles (the total area of the district being 3,654 square miles), and the estimates of the Revenue Survey department was Rs. 4,14,000 for a 4-inch topographical survey and Rs. 6,90,000 for a detailed field survey. The estimate for a detailed field survey of the entire district was Rs. 9,13,500. With these estimates before it, the Government of Madras at first decided to make a detailed field survey of the deltaic area, on the ground that economy would be served by surveying it at once in all the detail required for settlement purposes. In regard to the extension of the survey to the rest of the district, it was decided to await the decision as to the revision of the land-revenue assessment. Subsequently, however, it was represented by the Public Works department that a field survey was unnecessary for their purpose, and that the results would not be available for several years. In modification of its original decision the Government of Madras directed that the operations of the Survey department should, for the present, be confined to a topographical survey, showing village boundaries but not fields, and that it should be immediately commenced and completed, if possible, within 2½ years. This decision was communicated to the Secretary of State in a despatch, No. 23 of the 26th October 1882, in which the Government of Madras stated its conclusions as to the revision of the Tanjore settlement. In reply His Lordship stated that he would reserve his opinion until he should be in possession of the views of the Government of India.

4. In considering these questions, on which its views have thus been invited by the Secretary of State, the Government of India has been much assisted by the recent deputation of the Honorable Major Baring, the Financial Member, and Mr. Mackenzie, the Secretary of the Home department, to Madras, to confer with His Excellency the Governor in Council on certain matters of finance. The Government of India understands that the question of the survey and resettlement of Tanjore was fully discussed with the Government of Madras, and that His Excellency the Governor in Council will

probably not object to a complete survey of the district in the same way that the ryotwari tracts of other districts in the Madras presidency have been surveyed. That this will have eventually to be undertaken, irrespective of any revision of settlement, seems probable; and as a partial survey on a large scale has already been decided on in the interests of the Irrigation department, the Government of India is inclined to think that economy would be best consulted by making the survey in all the detail required for settlement purposes. As, however, the cost of such a survey will fall on Provincial revenues, the Government of India will only intimate its own opinion on the subject and leaves to the Government of Madras the decision as to the ultimate necessity, as well as to the most convenient time for undertaking such a survey.

5. As to the resettlement of Tanjore, the Government of India is indisposed on general grounds to interfere with any settlement which there is *primâ facie* reason to believe is moderately equable in its incidence on individuals, and secures to the State its fair share of revenue. To the arguments on which the objectors to a revision of the Tanjore settlement rely, the Government of India is thus prepared to give full weight, so far as they are applicable to the case in question or are founded on ascertained facts. There appears to be no doubt that, in comparison with other districts in the presidency, Tanjore is lightly assessed, and that the incidence of the assessment is, moreover, specially unequal in that district. It is admitted that the Tanjore ryot has no legal claim to be treated in any peculiar or specially favorable manner, though it would be a most deplorable misfortune if his prosperity were destroyed by a revision of the present settlement. But it is clear that one, if not the chief, cause of his prosperity lies in the great rise in the price of agricultural produce since the commutation values were fixed in the early days of the century, and that the rise is due to general causes in operation throughout British India.

6. The Government of India therefore would prefer that the question of a resettlement of Tanjore should not be treated as a special one, to be decided apart from the general principles on which the revision of terminal settlements is undertaken in India. These principles, so far as they are applicable to Northern India, have been lately under consideration of this Government in consultation with the Secretary of State, and the letter in which the conclusions arrived at have now been communicated to the Government of the North-Western Provinces has been forwarded with my letter No. 536 R., dated 15th instant, to His Excellency the Governor for consideration how far these conclusions are applicable to the ryotwari province of Madras. It is probable that His Excellency the Governor in Council will see fit to deal with the question of Tanjore according to the general decision which he may arrive at in regard to the resettlement of other districts in the presidency. If the main features of the scheme laid down in this Government's letter to Sir A. Lyall are accepted by the Government of Madras, it would have to be decided into which class of districts the district of Tanjore would fall. If it be deemed to come under class I on the ground that the settlement is a fairly adequate one, the present assessments would then be taken as the initial assessments, and would be liable to be raised in future only on the ground of a rise in prices and extension of cultivation. On the other hand, if the Government of Madras after a full review of the facts decide that the assessment is inadequate and its incidence notably unequal, the proper course would seem to be to place Tanjore in the third class of districts, and to survey and assess it *de novo*.

7. There is one question, however, in this connection to which the Government of India would invite the attention of the Government of Madras. It is understood that a large portion of the cultivated area of the Tanjore district is leased out by the *mirasidars* to sub-tenants, and it is stated that the latter are not less severely rack-rented than the tenantry on zemindari estates whose condition has for some time past been considered by the Government of Madras to call for legislation. The Government of India is unaware whether there are any sufficient grounds for applying similar remedies to tenants in Tanjore or in any other non-zemindari tracts; but it may be remarked that legislation for the protection of sub-tenants is immensely assisted by an accurate survey and record of facts, and even if there should be no call for legislative remedies in Tanjore, these measures would still be of benefit to the ryots, if by this term may be understood actual cultivators of the soil, whether sub-tenant or not.

Read—the following G.O., dated 19th March 1884, No. 303 I., Public Works:—

Read—the following G.O., dated 22nd February 1884, No. 854, Revenue:—

Read—the following letter from the Superintendent, Madras Survey, to the Secretary to Government, Revenue Department, dated 18th February 1884, No. 44 G.:—

The system adopted for the survey of the Tanjore district which is neither a revenue nor a topographical survey, but which partakes of the character of both, has not, I regret to say, worked satisfactorily. It may be easily imagined that though the men employed were perfectly competent to execute a survey of one kind or the other, they found great difficulty in carrying out work of this mixed character to which they were quite unaccustomed, and accordingly much delay has occurred through numerous errors and misconceptions.

2. The survey has now advanced to that stage when a considerable amount of mapping will very shortly be put in hand. The Vattam boundaries have been demarcated and surveyed as if for a revenue survey, and the sub-divisions of villages in the same manner; but the sub-divisions have been made partly with reference to the survey requirements, and partly with reference to the accurate delineation of the principal channels. So far all the work done has been on the basis of a revenue survey and will serve for the revenue survey when it is taken up. But when we come to the actual mapping, the system diverges altogether from that of a revenue survey. The maps, a few of which have been prepared as specimens, are plotted on the 4-inch scale to suit the requirements of the Irrigation department. Here we find the first objection to attempt to combine the system of revenue with topographical survey; for the boundary lines, which have been surveyed and demarcated and their positions accurately computed, with great care and at considerable cost, cannot be laid down on so small a scale as that of four inches to the mile without making the map confused and unsightly. In fact the accuracy and precision of the boundary survey are thrown away on such a map. We next come to the completion of these maps by filling in the details. This must be done by plane table on the system of a topographical survey and the objection to this is a serious one, because the whole of this work will be absolutely useless for the purpose of a revenue survey, and the expenditure upon it will be simply money lost.

3. If the revenue survey is to be carried out, I would very strongly advocate the advisability of having it done at once, thus replacing the present anomalous method of survey by a regular cadastral survey. The present method entails great difficulties and delays, and necessitates the doing of a great quantity of work twice over and will not after all be satisfactory. On the other hand, a regular revenue survey will be conducted on the well-defined method which has secured perfectly satisfactory results for so many years, and from the revenue survey maps which will thus be produced, maps of any other kind specially prepared to meet the requirements of the Irrigation or any other department, can be readily and economically produced.

4. The adoption of the regular revenue survey may delay the completion of the maps for irrigation purposes, but if a judicious increase be given to the establishment by the introduction into it of a few officers having the necessary acquirements, this delay may be very much reduced. At all events the delay will be very much more than compensated by the production of a really satisfactory survey and without any unnecessary cost.

Order—dated 22nd February 1884, No. 854, Revenue.

Referred to the Irrigation department, for favor of remarks, with reference to the Chief Engineer's memorandum recorded in G.O., dated 5th September 1882, No. 938, Revenue department.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

No. 48 I.

Note by the Acting Chief Engineer for Irrigation.

The requirements of the Irrigation branch, Public Works department, have been clearly laid down, and so far as we are concerned, the method adopted in conducting the survey is of no moment, so long as we get what we require. If the scale of four inches to a mile is too small for plotting accurately the boundary survey, by all means let a larger scale, such as the Superintendent may decide is most convenient, be adopted; the maps can always be reduced.

2. The Government have decided that a revenue survey is not at present required, but sooner or later such a survey must have to be undertaken, and it is evidently a waste of money to do work now which will be "absolutely useless for the purpose of a revenue survey" when the ordinary revenue survey maps can be made to meet our requirements. As therefore the interests of Government seem to require that the course proposed by the Superintendent, Revenue Survey, should be adopted, some delay in the completion of the maps required for irrigation must be accepted. It is hoped, however, that if this course is adopted, the suggestions made by the Superintendent regarding increase of establishment in order to minimize the delay may receive attention.

DOWLAISHWERAM,
10th March 1884.

(Signed) J. O. HASTED, Colonel, R.E.,
Acting Chief Engineer for Irrigation.

To the Acting Joint Secretary to Government,
Public Works department, Irrigation branch.

Order—dated 19th March 1884, No. 303 I., Public Works.

Forwarded to the Revenue department, with reference to order in that department, No. 854, dated 22nd February 1884.

(True Extract.)

(Signed) A. S. RUSSELL,
Under Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, VI circle.
" Chief Engineer for Irrigation.
" Revenue department.

ORDER—dated 2nd July 1884, No. 804, Revenue.

Land Revenue, No. 95.

His Excellency the Governor in Council resolves to direct that a revenue survey on the ordinary plan be substituted for the operations now in progress in Tanjore, which were undertaken to meet the requirements of the Irrigation department only. The Government have come to the conclusion that as a field survey of the district will eventually have to be carried out, it is expedient, on economical grounds, that operations should take this form at once; and although the change of plan may cause some delay in the production of the maps required by the Irrigation department, they will be more complete and will contain information in detail which will be of great value for administrative purposes generally.

2. In order, however, to reduce to the utmost this unavoidable delay, the operations of the field survey should be restricted for the present to the deltaic tracts already taken up; and the Government desire that efforts be made to produce, as soon as possible in a complete state, the village and combined maps and the area statements for two taluks—Tanjore and Kumbakónam.

3. The Superintendent of Revenue Survey will report, without delay, the detailed arrangements necessary to be made to carry out this programme; and with reference to paragraph 4 of his letter of the 18th February 1884, will state precisely what he would propose in order to expedite operations generally. The probable date of the completion of the two taluks named should be reported.

4. These orders will necessitate a revision of the arrangements under which the present survey is being paid for from Imperial funds. The grants hitherto made amount to Rs. 3,54,000 as noted in the margin. The grants of 1882-83 and 1883-84 will have to be refunded, and provision made to carry on the field survey during 1884-85 without a grant from Imperial funds. The Government, however, consider that from the refund should be deducted the excess of the cost of a block survey followed by a field survey over the cost of a field survey alone. According to the estimates such excess will be (Rs. 4,14,000 + Rs. 3,31,200 — Rs. 6,90,000 =) Rs. 55,200. The refund on these principles would be Rs. 98,800. The original estimates of cost may, however, need revision with reference to the experience acquired in the operations hitherto.

	RS.
1882-83	34,000
1883-84	1,20,000
1884-85	2,00,000

5. The Superintendent will report the actual cost of the present survey up to date; the probable sum which would be spent in 1884-85 if the present system were continued; how far such cost represents work which can be utilized for the field survey; whether the survey on the present system could be completed within the original estimate and, if not, what the excess would be; and whether the other estimates given in his letter, 12th December 1881, No. 207 G., viz., Rs. 6,90,000 as the cost of a field survey, and of Rs. 3,31,200 as the cost of making such a survey after the completion of the block survey, need modification. An estimate should also be given of the cost of completing a field survey engrafted on the block survey in its present stage and of the sum required for expenditure in the current financial year.

6. On receipt of this information the question of the provision of funds will be considered and the Government of India addressed in the Financial department.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Superintendent of Revenue Survey.
" Director of Revenue Settlement and Agriculture.
" Board of Revenue.
" Public Works department.
" Accountant-General.
" Financial department.

Exd. J. Henricus.

120 Copies.

No. 2382/137

Communicated to the officers in charge of Settlement parties

(By order)

[illegible]

1st Assistant

Depts of Revenue Sett: and Agriculture,
Madras 23rd July 1884

To,

The Dy Director No. III party

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 2nd July 1884, No. 804.

JULY.

Survey and Settlement of Tanjore.

Directing that a revenue survey on the ordinary plan be substituted for the operation now in progress, and calling on the Superintendent, Revenue Survey, to report the actual cost of the present survey up to date.

25 Feb 84

Reg No 79

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INDIA OFFICE;
London, 8th May 1884.

Revenue.
No. 31.

To His Excellency the Most Honourable the Governor General of India in Council.

MY LORD MARQUIS,—I forward, for Your Excellency's information, copies of two letters and their enclosures, received from the Director of the Royal Gardens, Kew, on the subject of the wood used in China for the manufacture of tea-chests.

Dated 29th March 1884.
" 14th April "

2. As the value of Indian tea is frequently considerably depreciated by the use of unsuitable wood for chests, it would seem advisable that, in accordance with Sir J. Hooker's suggestion, the information given in this correspondence should be communicated to the botanical officers of your Government and also made public for the benefit of tea-planters.

I have the honour to be,

MY LORD MARQUIS,

Your Lordship's most obedient, humble Servant,

KIMBERLEY.

Dated Royal Gardens, Kew, 29th March 1884.

From—Prof. W. T. THISELTON DYER, Assistant Director, Royal Gardens, Kew,

To—The Under-Secretary of State for India.

I AM desired by Sir Joseph Hooker to transmit to you copies of the enclosed correspondence with the Foreign Office on the subject of the wood used for tea-chests in China. Several enquiries have been addressed to this establishment on the subject, considerable loss to shippers having apparently been incurred owing to the accidental choice of unsuitable wood, especially that of the wild mango (*Mangifera sylvatica*) for the purpose.

Sir Joseph Hooker thinks that the information now obtained may be useful to the botanical officers of the Bengal Government.

Dated Royal Gardens, Kew, 29th November 1883.

From—Prof. W. T. THISELTON DYER, Assistant Director, Royal Gardens, Kew,

To—The Under-Secretary of State for Foreign Affairs.

I AM desired by Sir Joseph Hooker to inform you that enquiries have been addressed to the Royal Gardens from Ceylon as to the nature of the wood used in China for making the chests in which tea is imported into this country.

It is a matter of considerable commercial importance, as in some cases Indian tea has proved irretrievably damaged on its arrival in this country owing to the corrosive action of the wood in the lead lining of the chests.

The tea has consequently been unprotected from damp, and has further been deteriorated by a flavour communicated by the wood.

Under these circumstances, Sir Joseph Hooker is of opinion that it would be well worth the trouble if the Secretary of State should think fit to invite Her Majesty's Consuls in those parts of China from which tea is exported, to enquire into the matter and report, as far as they are able, as to the nature of

the wood most generally in use. Perhaps the attention of Dr. Hance, whose knowledge of Chinese botany is so extensive and accurate, might be particularly directed to the question.

Dated Foreign Office, 28th March 1884.

From—PHILIP W. CURRIE, Esq., Under-Secretary of State for Foreign Affairs,
To—Prof. W. T. THISELTON DYER, Assistant Director, Royal Gardens, Kew.

In Consul Sinclair's No. 6, dated 11th February 1884.

WITH reference to the letter from this Department of the 5th of December last, I am directed by Earl Granville to forward to you herewith, for the inspection and use of Sir Joseph Hooker, a sample of the wood that is said to be exclusively used at Foochowfoo for making the chests in which tea is exported thence to this country.

In forwarding this sample, Her Majesty's Consul at that port states that it is the common pine wood of China (*Pinus sinensis*), and is produced principally in Ting-chow-foo, a prefecture of the province of Fuhkien in the North-Western Direction, several hundred miles to the north of Foochow, where timber of this description grows in great abundance and is brought down the Min river in rafts like those seen on the Rhine.

Mr. Sinclair adds that this wood is also greatly used for coffins in preference to any other, on account of its consistency and durability.

Dated Royal Gardens, Kew, 14th April 1884.

From—Prof. W. T. THISELTON DYER, Assistant Director, Royal Gardens, Kew,
To—The Under-Secretary of State for India.

WITH reference to my letter of 29th March last, I am now desired by Sir Joseph Hooker to transmit to you, for the information of the Government of Bengal, further copies of reports from Her Majesty's Consular Officers in China on the subject of the wood used for tea-chests in that country.

No. 4, dated British Consulate, Chinkiang, 22nd February 1884.

From—E. L. OXENHAM, Esq., Her Britannic Majesty's Consul, Chinkiang,
To—The Secretary of State for Foreign Affairs.

I HAVE the honour to acknowledge receipt of Circular of December 5th, 1883, directing enquiries to be made in this Consular District as to the nature of the wood most generally in use for making the chests in which tea is imported into England.

In reply, I beg to state that the result of enquiries shows that the willow tree most commonly furnishes the wood used in China for making tea-chests. It is cheap and abundant, is easily sawn into boards, holds nails well, not splitting when they are driven in, and does not exercise any corrosive action on the lead lining of the chest. Pine wood, which is equally cheap, has been also tried, but is found to be unsuitable for the purpose. It does not hold the nails, splits easily, is liable to exude turpentine and injure the lining, and when new, shrinks and cracks.

Other woods, such as the chestnut and Huai or locust tree (*Styphnolobium*), are also equally available for the purpose, but are generally too scarce and dear to be much used. In a few places, however, where such trees are abundant they are occasionally used, but never for long, as they are valuable both for ornamental and edible purposes.

No. 3, dated British Consulate, Kinkiang, 18th February 1884.

From—G. JAMIESON, Esq., Her Britannic Majesty's Consul, Kiukiang,
To—The Under-Secretary of State for Foreign Affairs.

REPLYING to Foreign Office Circular of December 5th last, requiring information as to the kind of wood used in the manufacture of tea-chests in

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China, I have the honour to state that I am informed that the wood universally used in this district for the above purpose is that known by the natives as the "*Fung*" tree.

The "Fung" appears to correspond to the genus *Liquidambar*, of which there are several varieties.

I am unable to say which is the more common in this neighbourhood, but all appear to be available for tea-packing, the recommending feature being that this wood imparts no flavour to the tea. A large proportion of the best teas is exported from Kiukiang, the chests for which have all been manufactured locally for many years; and I have never heard complaints of any corrosive action on the lead linings.

No. 4, dated British Consulate, Tamsuy, 14th Februray 1884.

From—P. Foster, Esq., Her Britannic Majesty's Offg. Consul, Tamsuy,

To—The Secretary of State for Foreign Affairs.

In reply to the Circular from the Foreign Office of December 5th, 1883, I have the honour to state that seasoned common pine from the mainland portion of the Fokien Province is the wood most generally used within this Consular district for making the chests in which tea is exported to foreign countries.

No. 11, dated Shanghai, 27th February 1884.

From—P. J. Hughes, Esq., Her Britannic Majesty's Consul, Shanghai,

To—The Secretary of State for Foreign Affairs.

I have the honour to acknowledge the receipt of Your Lordship's Circular of December 5th, calling for a report as to the nature of the wood most generally in use within this Consular district for the purpose of making the chests in which tea is imported into England.

In reply, I beg to state tha' the tea-chests made at Shanghai are comparatively very few in number, the great bulk of the tea being packed in chests made in the interior.

The wood generally used in Shanghai is a sort of pine known as "*Shan mu*," probably the *Cunninghamia sinensis*. It is chiefly imported from the province of Fokien and is different from that used for tea-chests at some other ports in China. The wood is cut into suitable lengths and stored in a dry place for at least a year and sometimes two years before use. Green wood is rarely used; and when it is, it invariably injures the tea, causing a distinct pine flavour known in the trade as "woodiness."

I am informed that this flavour has never been found in Congon tea, but occasionally in the kind called Ping Suez.

Tea is packed up-country generally in chests made of the wood of the "Fung" tree, by which name Maple is generally understood; but it is also applied to the *Liquidambar*. More precise information on the subject of country packed tea will no doubt be supplied from Hankow and Kiukiang.

G. C. B. Press, Simla.—No. 279 R. & A. D.—26-6-84—635.

Revenue Department. 59

Proceedings of the Madras Government.

Read the following letter from the Government of India, Revenue and Agricultural Department dated 30th June 1884 No. 556. A.

I am directed to forward for the information of His Excellency the Governor in Council copy of a despatch from the Secretary of State No. 31 dated the 8th May 1884 with its enclosures, on the subject of the wood used in China for the manufacture of tea Chests.

Order thereon 16th July 1884 No. 3040.

Communicated to the Board of Revenue, the Director of Agriculture, Director of Government Cinchona Plantations, Parks and Gardens, Nilgiris, and the Several Planters' Associations.

(True Extract)

(Sd) H. E. Stokes
Secretary to Govt.

To, The Board of Revenue
" Director of Rev: Sett: & Agri: with the Govt:
" — " — Govt. Cin: Plantations
" — Planters' Association, Nilgiris

No. 1666

(True copy)

Communicated to the Agricultural Reporters and to the Officers in charge of Settlement Parties.

W. [illegible]

Director of Rev. Settlement & Agriculture

Dept of Rev. Sett & Agri
Madras, 22d July 18[illegible]

To, the Dy Director

Ino W. Carty

Enc

Stk

28TH MAY 1884, NO. 683, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—again the following G.O., dated 25th April 1884, Mis. No. 1749, Revenue :—

Read—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, in charge of the Inam Department, Madras, to the Secretary to Government, Revenue Department, dated 8th April 1884, No. 106 :—

In G.O., No. 773, dated 21st October 1872, it was directed that "all employés on the establishment of the Inam Commissioner engaged subsequent to the 11th July 1872, should be given clearly to understand that service in the Inam Department would not be allowed to reckon towards retiring allowance."

2. In Section 75 * (*a*) of the Civil Pension Code, it is laid down that service in the Inam Department of Madras qualifies for pension provided the officer was not engaged on the understanding that his appointment was only temporary, or that he would be liable to be discharged after a short period of service.

* 79 (*a*) 6th Edition.

3. I shall be obliged by your informing me whether the above quoted order of 1872 is intended, as it may very reasonably be interpreted to do, to apply only to officers entertained in the public service for the first time. I ask this question in regard to the following circumstances. The death of the head of the subordinate establishment and the arrangement made in consequence thereof make it necessary to bring in an outsider to fill up the Examinership, an office to which is attached a salary of Rs. 70 a month, as there is no one on the present establishment who could be appointed to it. I propose to fill the appointment by the transfer of a very competent officer who now draws Rs. 50 in the Settlement Central Office, but before doing so I wish to know if the order of 1872 would prejudice his service for pension. If in the opinion of Government it would, I have the honor to request that Government will be pleased to exempt this officer, Maganti Subba Rao, from the operation of the order so far as it would prejudice his service for pension. He has been in the public service for 23 years.

Order—dated 25th April 1884, Mis. No. 1749, Revenue.

Referred to the Accountant-General for report.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

READ—also the following letter from H. F. CLOGSTOUN, Esq., Accountant-General, Madras, to the Secretary to Government, Revenue Department, dated, Fort St. George, 9th May 1884, No. I.A.E.-49 :—

With reference to your endorsement No. 1749, dated the 25th April 1884, referring to me for report letter No. 106, dated the 8th idem, from the officer in charge of the Inam Department, requesting certain information regarding the character of service rendered in the Inam Department, I have the honor to invite attention to the orders noted in the margin, and to state that Section 79 of the Civil Pension Code provides that if an

Government of India, No. 3187, dated 24th November 1870.
Government of India, No. 2273, dated 22nd July 1871.

officer of the Inam Department is engaged on the understanding that his appointment is only temporary, or that he will be liable to discharge after a short period of service, his service in the department does not qualify for pension. In their Order No. 773, dated 21st October 1872, Pension Department, this Government directed that all employés on the establishment of the Inam Department engaged subsequent to the 11th July 1872, should be made clearly to understand that service in that department would not be allowed to reckon towards retiring allowance, thus practically declaring that all appointments filled up after that date were temporary, and the holders liable to discharge after a short period of service. If the post of Examiner in the Inam Department is likely to last for a period which would justify its being regarded as other than temporary, it is open to Government to declare, in modification of its Order of 21st October 1872, above referred to, that service in it shall be pensionable.

2. There do not appear to me to be any grounds for the assumption which Mr. Wilson makes in paragraph 3 of his letter, that the Government order of 1872 may have been intended to apply only to officers entertained in the public service for the first time. The policy seems to have been that temporary hands should be engaged for temporary work, and that all charges for gratuity and pension should be avoided.

ORDER—dated 28th May 1884, No. 683, Revenue.

Miscellaneous.

The Government observe that the Inam Commission has been in existence since 1859, and considering the amount of work still before it in connexion with the enfranchisement of service inams, no term within which it is likely to come to an end can be stated. In these circumstances, His Excellency the Governor in Council is of opinion that the order of 1872 went too far, and is pleased to rule that service on the office establishment of the Inam Commissioner, which is not entertained for mere temporary duty, shall count for pension.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Inam Commissioner.
,, the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.
,, the Pension Department.
,, the Accountant-General.

Exd. W. H. French.

100 Copies.

Inl No. 1733/84

Govt. of {1884} Madras.

REVENUE.

No. 1925
112

Communicated to the officers in charge of Settlement Parties.

(By order)

[signature]
1st Assistant

Deptt. of Reve: Settt. & Agriculture
Madras 6th June 1884

To
The Dy: Director, Party No. II

Exd. [illegible]

Issued

Recd. *Encl.*

G.O., 28th May 1884, No. 683.

MAY.

Inam Department.

Ruling that service in the —, which is not entertained for mere temporary duty, shall count for pension.

19/6/84 CW

Revenue Department.

62

Proceedings of the Madras Government.

Read the following proceedings of the Educational Department dated 26th May 1884 No. 286 Mis: on petition from Pochirazu Rangiah, Head Gumastah, Revenue Settlement No. I Party, Chittoor, dated 16th February 1884, praying for exemption from Examination rules and on Endorsement of the Revenue Department dated 5th May 1884 No. 1855 transferring letter from the Director of Revenue Settlement and Agriculture, dated 9th April 1884 No. $\frac{1144 A}{43. A}$, submitting a revised list of men to be exempted from the Middle School Examination.

In the absence of a specific recommendation from the Head of the Department as well as on general grounds the Government decline to exempt any of the individuals entered in the list received with the Director's letter read above.

Order thereon, 7th June 1884 No. 2407.

Communicated

Communicated to the Director of Revenue Settlement and Agriculture

(True Extract)

(Sd) H. E. Stokes.

Secretary to Government.

To

The Director of Revenue Settlement & Agriculture

No. 1914 A

(True copy)

Communicated to the Officers in charge of Settlement parties.

Dept. of Rev: Settlement & Agriculture Madras 11th June 1884

[signature]

Ag. 3rd Member, Board of Rev: in charge.

To

The Deputy Director of Rev: Settlement Party No. III.

Exd [initials]

22/1/84 ℓℓ

Regd. No. 68

63

INDIA OFFICE:
London, 7th February 1884.

(Revenue.)
No. 8.

To His Excellency the Most Hon'ble the Governor General of India in Council.

MY LORD MARQUIS,—In continuation of my predecessor's Despatch No. 105 (Revenue) of 9th December 1880, I forward herewith a copy of a letter Surgeon-General Balfour, respecting the cultivation of Manilla hemp in India, for such action as you may think fit to take in the matter.

I have the honor to be,
MY LORD MARQUIS,
Your Lordship's most obedient, humble Servant,
KIMBERLEY.

Dated 14th January 1884.

From—SURGEON-GENERAL BALFOUR, 2, Oxford Square, London,
To—The Under-Secretary of State for India.

ON the 15th October 1880, I had the honor of bringing to your notice in a memorandum, that a hemp which was being imported into the United Kingdom from the Philippine Islands, had been ascertained to be the true Manilla hemp from the *Musa textilis* plant, and averaging in quantity about 20,000 tons yearly, of value half a million sterling.

2. I mentioned that in 1861-62 the Madras Revenue Board had made continuous efforts to secure the naturalisation of this plant; that it grows as well in British India as other species of the plantain or banana genus, and that India could in a couple of years supply the London market with all that it could take of Manilla hemp fibre.

3. Mr. Liotard, on the 22nd January 1881, reviewed my memorandum, and remarked that "Dr. Balfour justly says that British India could in a couple of years supply the London market with all that it could take of Manilla hemp fibre."

4. After such publicity, I would, under ordinary circumstances, have left commercial interests to bring about any needed change;

Year.	Cwt.	Value.
		£.
1877 ...	332,304	488,069
1878 ...	421,160	551,856
1879 ...	337,687	434,037
1880 ...	407,431	622,776
1881 ...	353,770	691,186
1882 ...	373,231	830,033
1883 ...	330,132	747,031

but the Home accounts show that the quantity being imported from Manilla into the United Kingdom is not increasing and the price is almost doubling, and the time seems favorable for India to engage in its cultivation and find a place in the market.

Govt. C. B. Press, Simla.—No. 70 R. & A. D.—24-4-84.—600

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from E. C. BUCK, Esq., C.S., Secretary to the Government of India, Revenue and Agricultural Department (Fibres and Silk), to the Secretary to the Government of Madras, dated Simla, 24th April 1884, Circular No. 52F.S. :—

With reference to the letter from this office, No. 122, of the 21st April 1881, and subsequent correspondence, I am directed to forward a copy of a despatch * from Her Majesty's Secretary of State for India, respecting the cultivation of the *Musa textilis* or Manilla Hemp in this country, and to request that the Agricultural Department of the Government of Madras may be invited to take up the subject of the cultivation of this valuable fibre.

* No. 8, dated 7th February 1884, and enclosure.

Order—dated 6th June 1884, No. 715, Revenue.

Miscellaneous.

Communicated to the Director of Revenue Settlement and Agriculture.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

Exd. W. H. French.

80 Copies.

Incl. No. 1670/84

Govt. of (1884) Madras.

REVENUE.

No. 1507

Communicated to the officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

(By order)

[signature]

1st Assistant

Deptt. of Reve: Sett. & Agriculture
Madras 20 June 1884

To
The Dy. Director, Party No. III

Issued

Recd. Encl.

G.O., 6th June 1884, No. 715.

JUNE.

Manilla Hemp.

Letter from the Government of India forwarding copy of a despatch from the Secretary of State regarding the cultivation of — in India, communicated to the Director of Revenue Settlement and Agriculture.

5TH JUNE 1884, No. 706, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 16th February 1884, No. 542 :—

Read—the following letter from C. A. GALTON, Esq., Acting Collector of Malabar, to the Secretary to the Board of Revenue, dated Calicut, 20th November 1883, No. 4876 :—

I have the honor to submit, for the orders of the Board and Government, with reference to G.O.,* dated 3rd September last, No. 3605, copy of an able report by the Deputy Collector in charge of escheat operations, in which he reviews the history of the past and submits certain recommendations for the future. The nature of these operations has been so repeatedly discussed in the previous correspondence quoted in paragraph 2 of the Deputy Collector's letter, and is so well known to the Board and Government, that it is unnecessary to recapitulate.

* Communicated with the Board's Proceedings, dated 10th September, Mis. No. 7673.

2. The main question raised now is, whether the policy which was adopted nearly thirty years ago and which has been since reconsidered on several occasions, viz., that of selling the janmam title appertaining to Government in escheat lands, should be set aside or not. The Deputy Collector argues that the grounds on which this measure was advocated and sanctioned originally are insufficient; that it does not necessarily secure the object aimed at, viz., that security of tenure which is necessary to induce the actual occupant to improve his holding to the utmost; that it is open to serious objections and is productive of hardship, whilst the same end may be attained by other means which are not open to the same objection. He proposes that Government should retain the janmam right, fixing a moderate rent as their landlord's due, and, by guaranteeing to the tenant fixity of tenure so long as the Government demand is paid, set an example of enlightened administration to the land-owning classes of Malabar, or at least revise the valuation.

3. There is, in my opinion, a great deal of force in the Deputy Collector's arguments, and if the question of the policy to be adopted in regard to the disposal of these escheats were brought forward now for the first time, I should feel no hesitation in endorsing his views and giving them my cordial support; but looking to the length of time during which the settlements have been conducted on the present system, and the very large sums which have already been paid since the commencement of operations, I am afraid that any change of policy now in the direction indicated would be productive of much discontent on the part of the large number of those who have accepted the valuation of the Escheat Department and completed the purchase of the janmam right. I append a statement showing the extent to which the settlement has progressed already; the Deputy Collector has furnished one showing what remains to be done. It is not only the Cochin tenants who would have ground for complaint. Those of them who have paid up in full are few in number, viz., forty, who have paid a sum of Rs. 5,125 as the janmam value of their land, and it would not be difficult to revise the settlement in their case so as to place them on the same footing as those who have not already completed the purchase; in fact, this would be only equitable if it be admitted that the valuation of the Cochin lands is defective.

4. But any step of this nature might give rise to an outcry, on the part of all who have accepted the settlement in other parts of the district, that the valuation in their cases also was excessive and should be revised. As pointed out by Mr. Burrows in his letter recorded in Board's Proceedings, dated 5th February 1883, No. 319, this would be a gigantic work, and, in fact, is quite out of the question. The same objection applies equally to the Deputy Collector's alternative proposal to fix a moderate janmabhogam redeemable by the tenant at 20 or 25 years' purchase, or to revise the present valuation, interest at 5 per cent. being charged till the purchase-money is paid up. At first sight, one plan would appear to be the converse of the other, but as the methods by which janmabhogam is customarily fixed and valuation of landed property is arrived at are not identical, the results will be different. Of course, it may be argued that those who have accepted the terms offered by Government can have no valid ground of complaint because Government change their policy and offer different terms for the future, but the sales were in reality forced, as pointed out several times by Mr. Ballard, and the argument is, therefore, not fairly applicable to the present case. The tenants had really no option but to accept the terms offered, however hard, or lose their land; and it is not at all likely, I think, that those who have paid large sums for the acquisition of their rights will stand quietly by and see better terms offered to others without clamouring for similar treatment. They are not likely to be so philosophical as to reason in the same manner as the Deputy Collector at the close of paragraph 60.

5. At the same time, I think, a perusal of the previous correspondence will convince any one that none of the Collectors who have been longest connected with the district during recent years, and most intimately acquainted with its circumstances, have viewed the escheat operations with much favor. Mr. Ballard maintained that the Cochin valuations, though fully justified by local usage, were excessive, considering the forced nature of the sale, but he was overruled. His remarks at paragraph 10 of his letter embodied in G.O., dated 19th May 1869,* show that he was not in favor of the sale of the proprietary right to the tenant in the manner in which escheats were being disposed of, and he proposed for Tangacherry and Anjengo a moderate rental redeemable at twenty-five years' purchase, as suggested by the Deputy Collector now. Mr. Macgregor, in his letter recorded in G.O., dated 17th October 1872, stated that the settlement had already had an unfavorable effect on the agricultural interest of the district by withdrawing capital which would otherwise have been invested in the improvement of the soil, and showed that the collection of the demand was becoming more and more difficult. Mr. Logan, though he has not, as far as I am aware, left anything on official records regarding the subject, is, I know, from private communications received, very strongly opposed to the continuance of the present system, as entailing a very great drain on the resources of the cultivating classes, forcing them to incur debt and placing them in the hands of the money-lenders. In Travancore, he informs me, the Government waived all claims to anything but the full patham (rental), and I understand him to advocate a similar course for the future in dealing with the escheats in this district. I would suggest the advisability of a reference to him on the subject.

* *Vide* Board's Proceedings, dated 12th March 1869, No. 1684.

6. It will thus be seen that the three Collectors who have been longest associated with this district during the last twenty years are unanimous in condemning the present mode of settlement. It must also be borne in mind that, when the proposal was first brought forward and accepted, there was no idea that the operations would prove of such magnitude, or that the value of the escheats was anything like what has been determined by the settlement (*vide* the Collector's letters in G.O., dated 21st November 1866, and G.O., dated 17th October 1872). Much remains still to be done, and it is a question whether the present policy should be persevered in merely because a change may give rise to difficulties in dealing with those who have already accepted the settlement. My opinion on such a point is, I feel, not entitled to much weight, owing to my brief acquaintance with the district, but judging from what is on record, I

think there are very strong grounds for re-considering the question now. It would be best, I think, to deal only with the Cochin lands at first, leaving the settlement of other escheats (whether on different principle or not) to be taken up afterwards.

7. The question of bringing pressure to bear on the refractory Cochin tenants is now before the Board, and I lose no time in forwarding the Deputy Collector's report with these brief remarks. I have already reported that the Cochin tenants have no occupancy rights, as erroneously supposed, and there is, therefore, no legal obstacle to the measures of coercion proposed by Mr. Burrows. The question which I now bring forward is, whether it is politic to adopt them.

8. The reasonableness or otherwise of the Cochin valuation is, I think, hardly a point calling for further discussion now. It has been declared by the highest authorities after much debate to be perfectly fair and even liberal to the tenant, and if there were no other considerations to be urged, I would not hesitate to recommend enforcement of the decision arrived at. With reference to the comparison between the results of the valuation of the Cochin and Chetwayi lands, it seems to me quite as likely that the latter may be too low, as the former too high, but whatever may be the real state of the case in this respect, I do not think it is necessary to re-open the question. If Government are not prepared to reconsider the disposal of their proprietary rights in escheats, I would leave the valuation alone and take the necessary steps to carry out the settlement without further delay.

ENCLOSURE No. 1.

From P. KARUNAKARA MENON, Deputy Collector, in charge of Escheats, to the Collector of Malabar, Calicut, dated Ponáni, 29th October 1883, No. 266.

I have the honor to submit, as called for, the subjoined report on the state of escheat operations in this district. The object of the report is to show what remains to be done, and to submit to you my suggestions and recommendations as to how it should be done, but in doing the latter, it will, I find, be necessary for me to allude to the voluminous correspondence on the subject of escheats, extending over the last forty years, and here and there to go over ground which has been already gone over often more than once. I will nevertheless endeavor to make this report as short as possible.

2. The papers noted below relate to escheat :—

—	Date and Number.	Substance.
1. Collector to Board of Revenue.	5th December 1843, No. 149.	Reports result of survey of Betutnad Rajah's escheat, and recommends jenmabhogam being charged
2. Collector to Board of Revenue.	9th May 1850, No. 41.	Submits further information called for.
3. Board's Proceedings.	28th November 1850.	Submits Collector's proposal to Government for sanction.
4. Collector to Board.	3rd November 1852, No. 125.	Proposes sale of proprietary right, for reasons given.
5. Board of Revenue.	2nd December 1852.	Concur in Collector's proposal, but before applying to Government for sanction, wish to know to whom the right will fall if sold, whether it would displace present holders, who, if they have been long in possession, should not be displaced.
6. Collector to Board.	8th December 1852, No. 146.	Proposes to deal only with present holders ; is fully aware that it would be contrary to the wishes of Government to displace occupants of long standing, and promises, should such a step become needful, to make a special report to the Board.

—	Date and number.	Substance.
7. Board to Government.	13th January 1853, No. 13.	Recommend sale of janmam on above conditions.
8. Extract Minutes of Consultation.	19th February 1853, No. 196, Revenue Department.	Recommendation acceded to on the express condition that the arrangement be made only with the present holders, whose occupancy is, under no plea, to be disturbed.
9. Collector to Board.	25th September 1854, No. 127.	Government rights have been offered for public competition in those cases alone in which the actual possessors would have nothing more to do with the Government lands.
10. Board's Proceedings.	7th August 1858, No. 2989.	Our title to the Betutnad Rajah's escheat is scarcely tenable in a legal point of view.
11. Government Order.	6th December 1860, No. 2327, Revenue Department.	
12. Board's Proceedings.	14th November 1860, No. 5305.	In the case of indigent tenants, puttahs will be issued to them as tenants according to the usage of the district; difficult cases should be reserved to the last.
13. Government Order.	6th December 1860, No. 2327, Revenue Department.	
14. Board's Proceedings.	24th April 1862, No. 2598.	Government should divest themselves of all rights as proprietors in escheats. They cannot adequately perform landlord's duties.
Board's Proceedings.	8th January 1863, No. 98.	
15. Board's Proceedings.	9th May 1864, No. 2790.	History of the Ernad Rebel's escheat.
16. Government Order.	20th May 1864, No. 867, Revenue Department.	
17. Collector to Deputy Collector.	24th December 1844, No. 4433.	Instructions regarding valuation, &c., of escheat lands at Cochin.
18. Petition to Collector by certain Cochin tenants.	14th January 1865 ...	Assert right to free-holds.
19. Collector to certain Cochin tenants.	2nd August 1865, No. 2297.	Tenants are not entitled to jenmam right on payment of twenty times the assessment.
20. Board's Proceedings.	28th August 1865, No. 5262.	Received the Collector's report on escheat operations in 1864-65 and considered liberal concessions to occupants necessary, the object being to discourage litigation and to leave occupants in undisturbed possession.
21. Board's Proceedings.	15th September 1866, No. 6605.	Collector's remarks on continuance of escheat operations.
22. Board's Proceedings.	24th September 1866, No. 6850.	Mr. Kanaran justifies his valuation of Cochin escheat.
23. Collector to Escheat Superintendent.	22nd July 1867 ...	Lands in possession of indigent tenants must not be sold outright.
24. Board's Proceedings.	4th June 1868, No. 4129.	Mr. Ballard considers valuations at Cochin require consideration and reduction, Mr. Kanaran protests. Board see no ground for disturbing valuation.
	23rd November 1868, No. 8264.	
25. Board's Proceedings.	11th January 1870, No. 4815.	Mr. Webster supports Mr. Kanaran and Board concur.
26. Government Order.	24th February 1871, No. 338.	The Secretary of State considers the Cochin valuations just, and suggests interest-bond system.
27. Board's Proceedings.	7th July 1871, No. 2796.	Measures should not be forced on which defeat the object of the settlement, viz., to secure to the hereditary tenants in fee-simple the land which they have long possessed.
28. Government Order.	27th July 1871, No. 1310.	

—	Date and Number.	Substance.
29. Board's Proceedings.	28th February 1872, No. 379.	Mr. MacGregor on Cochin escheats.—Escheat sales have impoverished the district. Board doubtful as to alleged depletion of agricultural capital. Mr. MacGregor recommends interest-bond system, but suggests legal difficulties. Court interference would be necessary to enforce claims for purchase-money. Board are opposed to bond-system, think payment of purchase-money by instalment better. In their opinion, legislation necessary to secure powers to recover purchase-money summarily. Government are in favor of interest-bond system. Section 52, Madras Act II of 1864, might be extended by a short enactment to escheat cases. Government are, however, not satisfied that legislation would be needed, as interest would, by mutual consent, be added to assessment and Courts will have no power to interfere. The Secretary of State approves bond-system, but considers legislation expedient.
30. Government Order.	17th October 1872, No. 1434.	
31. Do.	25th March 1873, No. 358.	
32. Board's Proceedings.	23rd May 1873, No. 855.	Mr. Logan proposes and Board recommend janmam transfer to tenant, mortgage-back to Government as security for purchase-money, and lease and counterpart between Government and tenant for payment of "rent" (interest).
33. Board's Proceedings.	23rd July 1873, No. 1372.	Board are of opinion that no clause in deed could make executor liable to arrest or imprisonment under Madras Act II of 1864. They even think it would not legalize seizure of property.
34. Government Order.	16th December 1873, No. 1436, Revenue Department.	Advocate-General's opinion.—It is questionable whether in this country any form of mortgage-deed can obviate necessity of going into Court before right of sale can be exercised.
35. Collector to Cochin Tenants.	25th May 1874.	Question of valuation cannot be reopened. If interest-bonds are not executed, suits will be commenced.
36. Do.	20th October 1876.	
37. Board's Proceedings.	19th May 1875, No. 1365.	Cochin valuation operation explained and tenants' arguments met. Secretary of State considers explanation satisfactory. Government consider form of interest-bond sufficiently binding and legislation unnecessary. Secretary of State trusts that the anticipations will be justified.
38. Government Order.	21st June 1875, No. 941, Rev. Dept.	
39. Do.	24th November 1875, No. 1681.	
40. Collector to the Head Assistant Collector.	25th August 1876, No. 1892.	In case of default, purchaser should be called upon to execute interest-bond. Land should not be sold.

3. It will be seen that escheat operations in this district commenced nearly forty years ago, when, on 5th December 1843, the Collector recommended the levy of janmabhogam on the estate of the Betutnad Rajah, who had died in A.D. 1792 intestate and without heirs.

4. Since then other estates and properties have been placed at the disposal of Government, some as escheat, others as forfeiture by rebels, others again by inheritance (*e.g.*, the lands at Cochin and on the island of Chetwayi, which we got from the Dutch), and in a few instances in consequence of their having been bought in at sales for arrears of land revenue.

5. It is needless here, however, to go into the history of the "Escheats" as the various descriptions of estates and properties now known by that name are collectively called. Suffice it to say that we have still in hand at present mainly—

(1) The "Betutnad Rajah's Escheat."
(2) The "Chenat Nair Escheat," which, however, in fact includes the estates of two Brahmans, called Korat and Ponnangat Nambudiris, in Pálghat taluk.
(3) The estates of certain Mappilla rebels in Ernád and Walawanád taluks confiscated to Government.
(4) The Dutch lands at Cochin on the island of Chetwayi (Manaprom), &c., and ceded to the British in 1795.
(5) Lands relinquished by ryots owing to inability to pay tax or bought in by Government at revenue sales in Walawanád and Pálghat.

6. I beg to submit herewith a statement * exhibiting, in one view, the extent, &c., of land still remaining to be sold. It will be seen that the bulk of this land belongs to the Chenat Nair, Betutnad Rajah and Dutch Escheats which together aggregate Rs. 11,42,162 in value, while the remainder (Rs. 2,02,568) relates to the other kinds of escheats I have already enumerated in paragraph 5.

* Enclosure No. 1.

7. Though of the Chenat Nair Escheat there is on paper Rs. 6,49,908 worth of land still to be disposed of, yet, in point of fact, there is very little that can be done; for, as will be seen by the statement, most of the cases pending disposal are disputed, the Government title being denied by parties in lawful possession of the property, and the title itself being scarcely sustainable in a Court of Justice. The fact is that many lands have been registered and valued as escheat in the absence of sufficient evidence on which to rest our claim. In a great many of such cases, the land most probably ought to escheat, but in many I know that there was very little justification for the action of our paimash officers in registering the land as escheat. This, however, is a matter of detail. When once the future line of action in respect to escheats has been settled, each case will, of course, be disposed of on its merits, as far as our claim to the land involved is concerned.

8. The same remarks apply to the Betutnad Rajah's Escheat, whereof lands of the estimated value of Rs. 1,85,930 remain to be disposed of. Here, too, the majority of the pending cases are disputed, "our title to them (the lands) is scarcely tenable in a legal point of view" (Collector to Board, 12th August 1858, No. 135, see also G.O., dated 6th December 1860, No. 2327), and the difficult cases have been reserved to the last (Board's Proceedings, dated 14th November 1860, No. 5305).

9. Thus the most important item really is the Dutch Escheat at Cochin and Manaprom, and it is on the subject of this estate especially that I wish to have orders before taking up escheat work in earnest.

10. As we have already seen, and as pointed out by the Secretary of State (*vide* G.O., dated 24th February 1871, No. 338, Revenue Department), this estate is not escheat. It belonged to the Dutch, who ceded it to us in 1795. Particulars of the cession will be found in the report of the Malabar Commission.

11. The questions which require solution in the case of these lands, and especially of those at Cochin, are—(1) can they be sold? (2) Ought they to be sold? (3) If they can, and should be sold, on what terms are they to be sold? (4) If they can, but ought not to be sold, what is to be done with them?

I will offer a few remarks on each of these points.

12. Some of the tenants at Cochin have, I observe, set up claim to free-hold † and Sir William Robinson, when he was Collector of Malabar, I believe, reported to the Board that the tenants had been granted permanency of tenure. This, however, evidently is due to a misapprehension, for the agreements taken when the *pattoms* (lease-holds as the lands are still called) were leased, clearly provided for the resumption of the land when required; while as to the alleged right to free-hold, the Collector, I observe, told those who set it up, so long ago as 2nd August 1865, that they were not entitled to janmam right on payment of twenty times the assessment.

† *Vide* petition to Collector, dated 14th January 1875.

There can be no doubt whatever that Government have an unquestionable right to dispose of their proprietary claim to the Cochin lands, and that the parties in possession are at present only tenants-at-will.

13. But ought we to part with this proprietary right? I submit *not*. The only reasons I can find on record *for* the sale of the Government janmam right in escheats are noted below.

14. In connection with the Betutnad Rajah's estate, the Collector, Mr. Conolly, writing to the Board on 3rd November 1852, recommended sale on the ground that there were many tenants in possession who would not be brought to reason without great delay and trouble, but in whose

case the sale of the landlord's right would much facilitate this process. He observed that to the native of Malabar this fee-simple (janmam right) is all-important, great sacrifices being made to obtain it, and it being a matter of much coveted honor, while for the Government it is valueless in that point of view, and it can have no objection to dispose of a landlord's share and to stand in the same relation to escheats as it does to estates in general in Malabar; estates held in fee-simple, Mr. Conolly further observed, would be more cared for than those held on mortgage tenure; the proprietors would work at them with more heart and keep them in higher order, and, as a consequence, the Government tax would be more easily realized and remission less called for.

15. Mr. Grant in 1862 took the same view. He was of opinion that the uncertainty of the tenure under which escheat properties are generally held, renders the holders of them naturally anxious to purchase the janmam right.

16. In their Proceedings, dated 24th April 1862, No. 2598, the Board concurred with the Collector and considered it advisable that Government should divest themselves of all rights as proprietors in the properties referred to.

17. They again, in Proceedings, dated 8th January 1863, No. 98, expressed their opinion of the expediency of disposing of these janmam rights, "involving as they do landlord's duties which the Government cannot adequately fulfil, and the Government themselves have admitted that the measure is highly desirable in order to set at rest the minds of the present occupants and thus to encourage enterprise and the outlay of capital."

18. These arguments may be briefly stated thus—

(1) Janmam right is much coveted in Malabar;
(2) Permanency of title is essential to improvements;
(3) Government cannot adequately perform the duties of landlord.

Let us examine these arguments.

19. Janmam right, no doubt, is greatly prized in Malabar, and it is considered a matter of honor to be a janmi in respect of ever so small a plot of land. At the same time my own impression is that, whatever may have been the case thirty years ago, this right is mostly coveted at the present time in consequence of its being one of the best known kinds of tenure which secures permanency of title, so that the argument in favor of escheat sales is, in my opinion, reduced to two in number, viz.:—

(1) Fixity of tenure is necessary to improvement;
(2) Government cannot adequately perform landlord's duties.

20. With regard to the former argument, I do not consider the sale of janmam as at all indispensable to securing the end in view.

21. In this district there are at the present moment hundreds of cultivators who enjoy the advantage of permanency of tenure without themselves being janmies of the land they hold. A perpetual lease gives permanency of title as well as janmam can.

22. But to whom can we secure fixity of tenure by the sale of our proprietary right? Only to the present occupant, to be sure. But in how many cases out of a hundred are the present holders the actual cultivators? Supposing that the holders themselves *are* the actual cultivators, what guarantee is there that they will hereafter continue to be so? In cases (and they form the majority) in which the present holder is not the actual cultivator, does the former invest capital in the improvement of the land; and if he does not (and *that* is the truth), does *he* give permanency of title to those who hold under him? The answer is obvious, and as long as we are powerless to compel the person to whom we dispose of our right to give fixity of tenure to those holding under him—and I can see no reason to hope that at least for years to come the Malabar landlords, as a class, will, of their own accord, give permanency of title to the man, who, above all others, requires it most, viz., the actual cultivator, who alone, as matter of fact, employs labor and capital in improving the land—I fail to see what real benefit is conferred by our divesting ourselves of what we might make very good use of, as I hope to show further on.

23. Without meaning to maintain for a moment that uncertainty as to tenure should not be removed wherever possible, I may observe here that, in the case of the Cochin escheats, there is no reason whatever to suppose that the absence of a formal recognition of permanency of title on the part of Government has checked progress. The gardens, which form the bulk of the escheats there, are, as a matter of fact, in the words of Mr. Ballard, "generally well planted up. They are well and sometimes very highly cultivated now," while paddy fields are as well cultivated as such lands are elsewhere in the district.

24. The reason is not far to seek. Whereas tenants holding from private landlords have, in recent years, suffered seriously from being rack-rented and wantonly evicted, those who hold under Government, though they have never been formally recognized as tenants in perpetuity, have nevertheless never been either rack-rented or disturbed in their possession. In a word, they have enjoyed as much security and as liberal terms as can reasonably be expected.

25. The second argument in favor of disposing of the proprietary right in escheats is that Government cannot adequately perform the duties of landlord.

26. Now, what are the duties of a landlord as expected or performed in this country? I take them to be (1), to give the actual cultivator all reasonable encouragement for the investment of labor and capital in the improvement of the land, and (2), to invest his own capital where the resources of the tenant fall short of requirements.

27. At present few landlords do the former and none whatever the latter, while as to Government, they can very well afford to do both. They *will* no doubt do the former, and may or may not do the latter as they please; for even should they not elect to apply public money in the improvement of the Cochin lands, the tenants will not be at all worse off than their brethren elsewhere in this country.

28. Thus it seems to me that the reasons advanced are insufficient to warrant our divesting ourselves of the proprietary right in the Cochin lands, for which, in spite of the supposed janmam-hunger and the honor attaching to the position of a janmi, there has never been any demand.

29. I can think of no other argument that can be brought forward on the same side.

30. On the other hand, there are, I submit, very good reasons why we should *not* dispose of our janmam right; but I will content myself with very briefly stating one or two of them, which, in my opinion, amply counterbalance the arguments advanced in favor of sale.

31. In the first place, one example has a far better iufluence than a thousand precepts. In these days of complaints by tenants against their landlords, and our endeavours to ameliorate the condition of the former, we might, I venture to think, take advantage of the opportunity presented by the existence of these lands at Cochin to set to the Malabar landlords an example from which I anticipate very substantial benefit to the district.

32. I may confidently and without fear of contradiction assert that at least ninety-nine out of every hundred janmies (properly so called) in Malabar will any moment be found perfectly willing to sell off their proprietary rights on the terms on which we have hitherto been disposing of ours in escheat lands; and such being the case, we cannot, I submit, consistently continue the policy, hitherto followed, of selling our rights to the best advantage and condemn that of private landlords getting the utmost they can out of *their* property.

33. Here, then, is an excellent opportunity for Government to become a "*Model*" jamni. We might reserve the proprietary right and, at the same time, place our tenants on the same footing as persons holding under the Cochin and Travancore Governments, or under our own in other districts. I would give them permanency of title in practice, without exactly making them janmies in theory. They might be called upon to pay us annually a fair *Michchâram* or janmabhogam as the landlord's share, in addition to the assessment which is due to the Government of the country. This janmabhogam should be what a considerate janmi in Malabar (*e.g.*, the Zamorin Maharajah Bahadur) collects, or at all events used to collect till quite lately, from his tenants. The task of ascertaining and fixing it is not at all a difficult one. A responsible officer deputed for the purpose would, with the assistance of a couple of assessors, do it in a very short time. The rules for the ascertainment of *Michchâram* are well established by usage and familiar to all. Indeed, we ourselves have already years ago fixed janmabhogam and still collect it in the case of escheat lands in all parts of the district. As to the tenant he can have no reasonable cause for complaint, as the system is thoroughly understood and its justice recognized.

34. In the second place this is the only mode of settlement I can think of which is capable of giving effect to the desire of Government so often repeated, viz.; that tenants long in possession should not be disturbed (Board's Proceedings, dated 2nd December 1852, No.—); that the occupancy of the present holders should not be disturbed under any plea (Board's 13th January 1853, No. 13, and G.O., 19th February 1853, No. 196); that measures should not be forced on which defeat the object of the settlement, viz., to secure to the hereditary tenant in fee-simple the land which they have long possessed (Board's 7th July 1871, No. 2796, and G.O., 27th idem, No. 1310); and that in the case of indigent tenants, putta should be issued to them as tenants according to the usage of the district (G.O., 6th December 1860, No. 2327, Revenue Department).

35. These benign sentiments, though expressed with special reference to the Betutnad Rajah and Chenat Nair escheats, are, I submit, equally applicable to all lands at the disposal of Government, and with particular force to the Cochin estate, composed mostly of well cultivated gardens on whose improvement neither the Dutch nor the British Government are said to have spent a single pie.

36. The sale of our proprietary right as we please, though justifiable in theory, works hardship in this way. Unless the tenant in possession is able to pay down a lump sum at once, or agrees to pay interest on that sum till he can pay the principal amount, the land is sold over his head, and he finds himself at the mercy of one who tries to squeeze out of the land the utmost he can.

37. Here the question naturally arises, if the interest on the purchase money demanded by Government on the Cochin lands does not represent the janmabhogam which a considerate janmi in Malabar would levy on those lands. As the interest on the the purchase-money has been fixed at 5 per cent. in itself a very moderate rate in this district, the answer to the question must depend on the reasonableness of the value placed by us on the lands; and here I feel I am treading on forbidden ground.

38. The valuation has been already justified by those who effected it, approved by more than one Collector, and approved by the Board, the Government and the Secretary of State; but, with utmost deference to these authorities, I must be permitted to assure you that as repeatedly pointed out by Mr. Ballard (*vide* Board's Proceedings, 4th June 1868, No. 4129), the valuation requires consideration and reduction.

39. Perhaps you would like to know when and how the janmabhogam, which is at present levied on all our lands at Cochin, was fixed, and how the valuation to which I take objection was arrived at.

40. Till about the year 1874 the lands were, I observe, leased out from time to time on *pattam* for limited periods to the highest bidder. But in that year steps were taken to assess the gardens and fields and to fix a janmabhogam and to give them to tenants for occupation, Government reserving full power to resume the lease-holds whenever required. The operation appear to have lasted till 1858. The *modus operandi* was as sketched below.

41. All cocoanut trees at Cochin were treated as *Attuveppu* and they were divided into three classes. The assessment on the first sort was per tree 60 reas (80 pies), second sort 52, and third sort 44 (areca and jack trees may be left out as they are very few at Cochin). For the purpose of fixing a pattam or rent, the trees were divided into three classes, and a first-class tree was taken to yield 56 nuts, a second-class one 42, and a third-class one, 24 per annum. Of course, the same garden generally contained trees of all the three classes.

The aggregate produce of the garden being thus estimated, it was commuted into money at the rate of Rs. 10 a thousand nuts. Out of the value was deducted the assessment at the rates already specified, the balance being charged as janmabhogam.

42. In the case of paddy fields, out of the estimated gross outturn, seed and expenses of cultivation were deducted first and one-third of the balance afterwards as the cultivator's share, and 65 per cent. of the remainder was taken as assessment and 35 per cent. as janmabhogam.

43. In fixing the valuation, on the other hand, all bearing cocoanut trees were divided into three sorts. On each tree of the first sort the rent was fixed at one rupee, on second sort twelve annas, on the third sort eight annas; out of the total rent thus fixed was deducted the existing assessment, and twenty-five times the balance was fixed as the janmam value of those trees.

A value was next placed on trees not yet come into bearing at the following rates:—

Kula	Rs. $1\frac{1}{2}$ to 7 (mostly Rs. 5).
Maram	Annas 12 to Rs. 4.
Sphudam (? Anayadi) ..	Do. 8 to Rs. 2.
Kili	Do. 4 to 12.
Kuli	Do. 2 to 4.

and this value was added to twenty-five times the rent above alluded to.

In cases in which more trees were found to be present than the number in existence at the time of the paimash of 1847—58, the tenant was allowed Kulikanam (value of improvements) on the difference at half the value fixed, it being, however, always assumed, somewhat arbitrarily in my opinion, that the full number of bearing trees present in 1847—58 were still not only in existence, but were likewise in full bearing. The consequence was that the tenant seldom or never had any bearing trees for which to claim Kuikanam.

44. In the case of paddy lands an acre was supposed to be capable of sowing 6 *parahs* (60 McLeod seers) of seed, the *net* outturn taken ranged from ten to twenty times the seed and the janmam value was fixed at 100 fanams for every 5 *parahs* of this outturn, after deducting 2 *parahs* for every rupee of the assessment. As matter of fact, however, the majority of the fields do not sow as much as 6 *parahs* of seed, the outturn was calculated at too high a rate as a *net* multiple (Méni) and 2 *parahs* per rupee of assessment was too little.

45. At Manaprom (the island of Chetwayi), on the other hand, where the cocoanut trees are almost as good and productive as at Cochin, and where facilities for exporting the produce are not at all wanting, the trees were classified as first, second, third and fourth sorts, and rents of 1, $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{1}{4}$ gold fanam (equal to 4 annas and 7 pies), respectively, fixed. The late Mr. Kanaran deducted half the assessment from the rent so fixed, and estimated the janmam value at forty times the remainder. He fixed values at rates noted in the margin on unbearing trees, and allowed two-thirds to be deducted as the tenant's compensation. He allowed nothing in respect of bearing trees.

	RS.	A.	P.		RS.	A.	P.
Kula	1	2	0	to	4	0	0
Maram	1	2	0	to	2	8	0
Sphudam	0	10	0	to	1	4	0
Kili	0	4	0	to	0	9	0
Kuli	0	2	0	to	0	7	0

His successor, Mr. Kannan, fixed the janmam value at forty years' purchase on the rent estimated as above, *without* deducting anything on account of assessment, but *after* deducting as *Kudiyánkur* or tenant's share on bearing trees, 6, 5, 4 and 3 gold fanams, respectively, on the four classes of trees.

46. In the case of paddy fields at Manaprom, the settlement would appear to have been conducted on several principles. In the two southernmost amsams, Panangad and Papinivattam, Mr. Kanaran, I observe, made the measurement of fields, as given in the *Hindubi* accounts, the basis of calculation. On this area the seed per acre was assumed at 60 seers and the field was classified into six sorts according as they appeared in the *Hindubi* accounts, the net outturn multiple being for the several sorts 10, 8, 6, 5, 4 and 3, respectively. The assessment was arbitrarily assumed to be Rs. 2 an acre for *kanni* land, Rs. 3 for *magarom* land, and Rs. 5 for two-crop land, and 3½ *parahs*, or 35 seers, deducted out of the *net* outturn for every rupee of this suppositious tax. The janmam value was then fixed at the rate of 100 fanams (4 annas 7 pies) for every 2½ *parahs* of the remainder.

Mr. Kannan, who afterwards completed the settlement of these two amsams and likewise settled the remaining amsams at Manaprom, followed the same principle, with this difference, however, viz., that instead of the *Hindubi* measurement, he took the actual measurement of the fields.

47. The result of all this is that at Cochin the net janmam value per first sort bearing tree comes to Rs. 21, second sort Rs. 15½, and third sort Rs. 9¾, while at Manaprom the figures are 6¾, 4½ and 1⅓, respectively.

Comment is unnecessary.

48. Cochin being an isolated commercial town, in the midst of a Native State, and not possessing any large surplus wealth for investment in the comparatively less profitable, though more safe, speculation in landed property, and the bulk of our tenants being moreover poor, the consequence, unless either the valuation is considerably reduced or (better still) the idea of disposing of our janmam right is abandoned and a moderate janmabhogam charged, must, I am thoroughly convinced, be that we shall have to evict men who for generations have lived on the property and improved it with immense trouble and at great expense. Some of the lands would appear to have been mere swamps at one time, and it is not maintained, I think, that either time or *our* capital has contributed to their reclamation. In such cases it seems to me extremely hard that those whose labor and capital have turned such lands into gardens and fields should now be turned out, or be called upon to agree to pay from year to year a sum as interest on the value fixed by us, which, I have no doubt, will eventually lead to their ruin and the sale of their land.

49. For these and other reasons I venture to protest respectfully, but strongly, against, at all events, the Cochin escheats being offered in the open market, as, as matters stand, they must be, unless the tenants in possession accept the terms offered by us.

* Enclosure No. 2.

50. Our Cochin tenants may be classified under five heads as done in the abstract statement* herewith submitted, viz. :—

(1) those who have paid the janmam value in full;
(2) those who have paid portion of the value, but have not executed interest-bonds for the balance;
(3) those who have paid portion of the value and have executed interest-bonds for the balance;
(4) those who have not paid any portion of the janmam value, but have executed interest-bonds for the whole amount;
(5) those who have neither paid anything nor executed interest-bonds;
(6) those whose lands have been valued, but not yet sold or agreed to be sold.

and the question is how the several classes are to be dealt with.

51. In case Government decide not to dispose of the proprietary right, I would, as I have already hinted, suggest that a moderate janmabhogam be charged in addition to the ordinary assessment.

52. This impost has always been collected in this district under Madras Act II of 1864, and I can see no legal objection to this course. Land-tax in other districts is, I take it, composed partly of the landlord's rent or janmabhogam and partly of royalty, and no legal objection has been raised to the realization of the consolidated amount under the Revenue Recovery Act.

53. On the other hand, there seems to be considerable doubt as to the applicability of the Act to the case of interest on escheat janmam value under the existing bond system. The papers noted in the margin have reference to the point. Government, it will be seen, thought that facilities for collecting arrears might be provided by an enactment extending Section 52 of the Act to escheat cases; but they were not satisfied that legislation was needed. The Secretary of State, however, considered legislation expedient, while the Board thought it necessary. In their opinion no clause in the bond could make the party liable to arrest or imprisonment. They even doubted if property could be sold. They thought *not*. They thought the interference of the

Nos. 29, 30, 31, and 33 in paragraph 2.

Courts necessary to enforce our claim to the purchase-money. But Government still considered legislation unnecessary, and the Secretary of State trusted "these anticipations will be justified."

54. As to the law officers of the Crown, I see the Advocate-General has expressed his opinion (G.O., 16th December 1873, No. 1436, Revenue Department) that it is questionable whether in this country any form of mortgage deed can obviate the necessity of going into Court before a right of sale under it can be exercised.

55. Thus the levy of a janmabhogam has, as matters now stand, a decided practical advantage over the levy of interest on purchase-money.

56. In the next place, I would briefly submit my recommendations as to the course to be adopted in the event of Government still deciding to divest themselves of their proprietary right. In this case also I would suggest that a moderate janmabhogam, such as a liberal and considerate janmi who has a regard for the well-being of his tenantry and the improvement of his estate would charge, be fixed, and the tenants be allowed to redeem this rent at 20 or 25 years' purchase, or at all events that the valuation fixed some years ago be carefully considered and reduced.

57. In either of the above cases it would be necessary in the interests of fair play to decide as to what is to be done in the case of (1) tenants who have already paid up the janmam value in full, and (2) tenants who have either paid a portion of the money and executed interest-bonds for the balance, or have paid nothing but have signed bonds for the full amount.

58. I would, for obvious reasons, not interfere with the former class of cases. They are not many.

59. In the case of tenants who have not paid the full value, I would, in case Government decide not to sell the proprietary right, cancel the transactions, refund portion of the purchase-money paid, if any, and charge instead a reasonable janmabhogam. Should the order be to sell the janmam, I would fix a reasonable janmabhogam and give the tenant the option of redeeming it at 20 or 25 years' purchase, or, at the very least, reconsider and reduce the valuation, in either case giving the tenant credit for any money he may have already paid.

60. I am fully conscious of the fact that in the event of my recommendations finding favor with Government, those tenants who have already accepted our terms will have fared worse than those, who, in a manner, have been refractory and contumacious. But the objection is one that migh be started against almost any change of policy; I am far from holding that those who have been refractory have been so without sufficient cause, and in any case, I venture to think it but poor consolation to the one set of tenants that the other set has not been equally unfortunate with themselves.

61. So much for the Cochin "escheats." Briefly to sum up—

(a) The Cochin tenants have no right to free-hold.

(b) The Government proprietary right ought not to be sold; a moderate janmabhogam should be charged and levied in addition to the ordinary assessment.

(c) Should it, however, be resolved that the janmam right shall be sold, even then a moderate janmabhogam should be fixed and the tenant allowed to redeem it at 20 or 25 years' purchase or, at the very least, the valuations already fixed should be carefully considered and considerably reduced.

62. With regard to the Chenat Nair escheats, I have already pointed out that almost all the cases remaining to be disposed of are disputed ones, the right of the State being denied by the parties long in possession. The same remark applies to the majority of cases belonging to the Betutnad Rajah's estate. In nearly all these cases the evidence in our favor is of a most unsatisfactory character as regards both quantity and quality. One unsuccessful suit by us might have brought all escheat operations to a standstill. This, I observe, is the reason why difficult cases have been reserved to the last as stated in paragraph 8. Perhaps the same course might be continued yet awhile.

63. In all other cases, whether belonging to the Chenat Nair, the Betutnad Rajah, or any other escheat in the district, I would strongly recommend that the proposals I have submitted in this letter with regard to the Dutch "Escheat" be extended to them also.

Enclosure No. 2.

Particulars of Escheat Lands sold as well as those remaining to be sold in Cochin Taluk.

Particulars of Purchasers.	Wet.							Garden.			
	Number of Holders.	Assessment.	Jenmabhogam.	Jenmam Value.	Amount paid.	Balance.	Interest at 5 per Cent. on the Jenmam Value (Column 5).	Number of Holders.	Assessment.	Jenmabhogam.	Jenmam Value.
1	2	3	4	5	6	7	8	9	10	11	12
Sold or agreed to be sold.		RS. A. P.	RS. A. P.	RS. A. P.		RS. A. P.	RS. A. P.		RS. A. P.	RS. A. P.	RS. A. P.
1. Those who have paid up in full	..	..	..	..	..	..	..	40	38 8 8	137 5 0	5,125 0 0
2. Those who have paid up in part and have executed interest bonds for balance ..	..	..	..	..	..	..	..	6	4 6 11	10 5 9	717 0 0
3. Those who have paid up in part but have not executed interest bonds for balance ..	7	98 0 5	80 15 3	9,025 0 0	1,495	7,530 0 0	451 4 0	28	69 12 8	192 10 9	11,946 4 0
4. Those who have not paid up at all but have executed interest bonds	1	138 14 4	74 12 9	5,400 0 0	..	5,400 0 0	270 0 0	70	366 7 11	681 9 3	36,496 0 0
5. Those who have not paid up at all and have not executed interest bonds	69	912 5 0	510 15 11	86,835 0 0	..	86,835 0 0	4,341 12 0	202	1,149 7 6	2,097 3 2	1,38,039 0 0
Total ..	77	1,149 3 9	666 11 11	1,01,260 0 0	1,495	99,765 0 0	5,063 0 0	346	1,628 11 8	3,119 1 11	1,92,323 4 0
Lands that remain to be sold ..	20	376 1 4	202 8 3	39,392 0 0	..	39,392 0 0	1,970 0 0	195	993 14 2	1,844 0 3	1,50,210 0 0
Grand Total ..	97	1,525 5 1	869 4 2	1,40,652 0 0	1,495	1,39,157 0 0	7,033 0 0	541	2,622 9 10	4,963 2 2	3,42,533 4 0

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Particulars of Escheat Lands sold as well as those remaining to be sold in Cochin Taluk—(*Continued*).

Particulars of Purchasers.	GARDEN—(*Continued*). Amount paid.	Balance.	Interest at 5 per Cent. on the Jenmam Value (Column 12).	TOTAL. Number of Holders.	Assessment.	Jenma-bhogam.	Jenmam Value.	Amount paid.	Balance.	Interest at 5 per Cent. on the Jenmam Value (Column 19).
	13	14	15	16	17	18	19	20	21	22
	RS. A. P.	RS. A. P.	RS. A. P.		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Sold or agreed to be sold.										
1. Those who have paid up in full	5,125 0 0	..	256 4 0	40	38 8 8	137 5 0	5,125 0 0	5,125 0 0	..	256 4 0
2. Those who have paid up in part and have executed interest bonds for balance ..	155 0 0	562 0 0	35 13 7	6	4 6 11	10 5 9	717 0 0	155 0 0	562 0 0	35 13 7
3. Those who have paid up in part but have not executed interest bonds for balance.	3,455 12 0	8,490 8 0	597 5 0	35	167 13 1	273 10 0	20,971 4 0	4,950 12 0	16,020 8 0	1,048 9 0
4. Those who have not paid up at all but have executed interest bonds	..	36,496 0 0	1,824 12 9	71	505 6 3	756 6 0	41,896 0 0	..	41,896 0 0	2,094 12 9
5. Those who have not paid up at all and have not executed interest bonds ..	..	1,38,039 0 0	6,901 15 3	271	2,061 12 6	2,608 3 1	2,24,874 0 0	..	2,24,874 0 0	11,243 11 3
Total ..	8,735 12 0	1,83,587 8 0	9,616 2 7	423	2,777 15 5	3,785 13 10	* 2,93,583 4 0	10,230 12 0	2,83,352 8 0	14,679 2 7
Lands that remain to be sold ..	..	1,50,210 0 0	7,510 0 0	215	1,369 15 6	2,046 8 6	1,89,602 0 0	..	1,89,602 0 0	9,480 0 0
Grand Total ..	8,735 12 0	3,33,797 8 0	17,126 2 7	638	4,147 14 11	5,832 6 4	4,83,185 4 0	10,230 12 0	4,72,954 8 0	24,159 2 7

* Of this amount jenmabhogam is not collected in respect of Rs. 5,000, the value of 77 gardens.

ENCLOSURE No. 3.

STATEMENT showing the Escheat and other Lands at the Disposal of Government in Malabar remaining to be sold.

Particulars.	UNDISPUTED.											
	Nunja (Wet).			Punja (Dry).			Garden.			Total.		
	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.
1	2	3	4	5	6	7	8	9	10	11	12	13
			RS.						RS.			RS.
1. Dutch lands—In Cochin, Manaprom, Anjengo and Tangachéri.	255	182	51,898	122	154	18,106	901	423	1,75,202	1,278	759	2,45,206
2. Chenat Nayar's Escheats—Pâlghat.	46	152	35,633	103	2,015	15,393	..	..	..	149	2,167	51,026
3. Bettatnâd Rajah's Escheats—Ponâni and Ernâd.	236	331	14,784	431	1,722	16,059	321	332	26,030	988	2,385	56,873
4. Forfeitures by Mappilla rebels—In Ernâd and Walawanâd.	14	34	6,637	55	18	2,245	..	..	..	69	52	8,882
5. Other Escheats—In Ponâni, &c.	52	145	34,970	74	733	6,492	15	18	2,776	141	896	44,238
6. Relinquished by ryots	83	195	60,626	84	752	9,892	..	..	..	167	947	70,518
7. Cantonment lands at Cannanore.	54	54	..	..	..	..	402	222	53,870	456	276	53,870
Total ..	740	1,093	2,04,548	869	5,394	68,187	1,639	995	2,57,878	3,248	7,482	5,30,613
River reclamations ..	..	..	..	..	..	..	..	..	..	..	..	..
Grand Total ..	..	..	..	..	..	..	..	..	..	..	..	..

Statement showing the Escheat and other Lands at the Disposal of Government in Malabar remaining to be sold—(*Continued*).

Particulars.	DISPUTED.											
	Nunja (Wet).			Punja (Dry).			Garden.			Total.		
	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.
	14	15	16	17	18	19	20	21	22	23	24	25
			RS.			RS.			RS.			RS.
1. Dutch lands—In Cochin, Manaprom, Anjengo and Tangachéri.	203	83	22,886	35	90	3,809	109	121	34,423	347	294	61,118
2. Chenat Nayar's Escheats—Pálghat.	1,738	2,057	5,38,723	829	1,058	60,159	..	..	..	2,567	3,115	5,98,882
3. Bettatnád Rajah's Escheats—Ponáni and Ernád.	852	708	50,934	505	932	10,271	813	741	67,852	2,170	2,381	1,29,057
4. Forfeitures by Mappilla rebels—In Ernád and Walawanád.	14	13	2,453	17	28	817	..	..	..	31	41	3,270
5. Other Escheats—In Ponáni, &c.	18	27	9,116	15	47	1,287	1	2	360	34	76	10,713
6. Relinquished by ryots	19	38	9,098	40	140	1,979	..	..	..	59	178	11,077
7. Cantonment lands at Cannanore.	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	2,844	2,926	6,33,210	1,441	2,295	78,272	923	864	1,02,635	5,208	6,085	8,14,117
River reclamations ..	..	..	..	..	..	..	..	..	..	..	..	..
Grand Total ..	..	..	..	..	..	..	..	..	..	..	..	..

Statement showing the Escheat and other Lands at the Disposal of Government in Malabar remaining to be sold—(*Continued*).

Particulars.	TOTAL.												Remarks.
	Nunja (Wet).			Punja (Dry).			Garden.			Total.			
	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.	Number of Lands.	Extent in Acres.	Estimated Value.	
	26	27	28	29	30	31	32	33	34	35	36	37	
			RS.			RS.			RS.			RS.	
1. Dutch lands—In Cochin, Manaprom, Anjengo and Tangachéri.	458	265	74,784	157	244	21,915	1,010	544	2,09,625	1,625	1,053	3,06,324	The site of the demolished fort and lands at Kalvathy in Cochin Taluk are not included.
2. Chenat Nayar's Escheats—Pálghat.	1,784	2,209	5,74,356	932	3,073	75,552	..	..	..	2,716	5,282	6,49,908	Of the "undisputed" 19 items of 957 acres are forest lands and have not been valued.
3. Bettatnád Rajah's Escheats—Ponáni and Ernád.	1,088	1,039	65,718	936	2,654	26,330	1,134	1,073	93,882	3,158	4,766	1,85,930	
4. Forfeitures by Mappilla rebels—In Ernád and Walawanád.	28	47	9,090	72	46	3,062	..	..	..	100	93	12,152	
5. Other Escheats—In Ponáni, &c.	70	172	44,086	89	780	7,729	16	20	3,136	175	972	54,951	
6. Relinquished by ryots ..	102	233	69,724	124	892	11,871	..	..	..	226	1,125	81,595	
7. Cantonment lands at Cannanore.	54	54	..	..	..	..	402	222	53,870	456	276	53,870	The wet lands have not been valued and they are reserved.
Total ..	3,584	4,019	8,37,758	2,310	7,689	1,46,459	2,562	1,859	3,60,513	8,456	13,567	13,44,730	
River reclamation ..	..	..	..	..	..	..	..	..	..	1,612	2,248	2,65,005	
Grand Total ..	..	..	..	..	..	..	..	..	..	10,068	15,815	16,09,735	

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Read—the following paper from C. A. GALTON, Esq., Acting Collector of Malabar, to the Secretary to the Board of Revenue (with reference to paragraph 3 of the Collector's letter, dated 20th November 1883, No. 4876), dated Calicut, 30th November 1883, No. 4913 :—

STATEMENT showing the Result of the Escheat Sales from the commencement of the Escheat Operations up to October 1883 in the District of Malabar.

Particulars of Escheat.	Sold up to Date.	Paid up to Date.	Balance.		
			Interest on Instalment Bonds executed.	No Bonds executed.	Total.
1	2	3	4	5	6
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1. Dutch escheats .. .	9,74,949 3 3	2,93,089 11 3	49,510 0 0	6,32,349 8 0	6,81,859 8 0
2. Chenat Nayar escheats ..	*7,41,442 10 0	6,72,429 9 10	26,471 7 6	42,541 8 8	69,013 0 2
3. Bettatnád escheats ..	2,87,576 9 6	2,61,042 7 6	15,803 0 0	10,731 2 0	26,534 2 0
4. Mappilla rebels	6,07,650 15 4	5,28,261 9 4	12,442 2 0	66,947 4 0	79,389 6 0
5. Other escheats	16,814 8 0	10,459 0 0	1,629 0 0	4,726 8 0	6,355 8 0
6. Sub-division of Malabar..	8,78,633 7 1	8,37,118 15 1	34,361 8 0	7,153 0 0	41,514 8 0
Total ..	35,07,067 5 2	26,02,401 5 0	1,40,217 1 6	7,64,448 14 8	9,04,666 0 2

Resolution—dated 16th February 1884, No. 542.

Submitted to Government with reference to G.O., dated 3rd September 1883, No. 3605.

2. That in British Cochin the settlement of escheat lands has been retarded owing to the unwillingness of many of the tenants to accept the terms offered, or rather to do what is required on their part for the full establishment of their titles, was broug t prominently to notice by Mr. Burrows when acting Collector of Malabar. His representations were carefully considered by the Board,† and it was decided to take the opinion of the Government Pleader as to the probable result of suits for ejectment against those tenants who have failed to accept the terms offered by Government. Mr. Shephard has made further inquiry regarding the facts, and information has been supplied to him from time to time by the Board, whose last communication with him was in November last.‡ Further action in the direction suggested by Mr. Burrows' letter must be deferred pending the receipt of the legal opinion sought.

† Board's Proceedings, dated 5th February 1883, No. 319.

‡ Board's Proceedings, dated 15th November 1883, Mis. No. 9487.

3. Speaking generally, the "escheats" in Malabar are of two kinds, those of Cochin which the British Government in 1795 took over from the Dutch, who held the jenm (landlord) right, and escheats proper which have fallen to this Government by the death without heirs, or rebellion, &c., of jenmikars. The former class is comprised within a limited area, the extent of the properties is known and defined and to a certain extent the holders have purchased the fee-simple of their estates at the Government valuation. The other class consists of properties scattered over the whole district, and estates are, of course, constantly falling into the hands of Government.

4. The brief summary of the correspondence upon the subject which is given below shows the manner in which, under present arrangements, the Government divest themselves of the jenmi's right and title. This arrangement requires that the tenant pay a lump sum (calculated in each case by the escheat officer on certain principles which have been accepted as sound by all the higher authorities, including the

* Includes Rs. 50,845, being the value of lands relinquished by ryots for arrears of revenue and subsequently sold by Government.

Secretary of State), and, in case he should find it inconvenient to pay the value at once, that he execute an interest bond under which he pays half-yearly interest * on the capital sum, the bond giving him the option to redeem at any time by payment of twenty years' interest.

* At 4 per cent.

5. Some tenants have paid up in full, some have given bonds, and some refuse to do either one or the other.

6. In 1852,† Mr. Conolly, then Collector, first proposed the sale outright of the jenm (landlord's) title to the lands of the late Rajah of *Betutnad*, which, for want of heirs, had escheated to Government in 1852. The Board ‡ concurred, but objected to the displacement of old tenants, and made further inquiry of the Collector, who answered § that he proposed to deal only with actual occupants. Thereupon the Board ‖ recommended to Government, in regard to all lands in the Betutnad estate, that the jenm title be sold. The price which the sale was expected to fetch was Rs. 60,000. Government sanctioned this proposal "on the express condition that the arrangement be made only with the present holders, and that their occupancy is not under any plea to be disturbed."¶

† Dated 3rd November 1852, No. 125.

‡ Proceedings, dated 2nd December 1852, No. 2372.

§ 8th December.

‖ 13th January 1853, No. 13.

¶ Extract from Minutes of Consultation, 19th February 1853, No. 196.

7. In 1854 ** Mr Conolly, in reporting progress, said that the result of the sales so far was thoroughly satisfactory, and the amount which would eventually be realized would be double the estimate.

** Letter, dated 25th September 1854.

8. In 1858,†† Sir W. Robinson, then Collector of Malabar, reporting upon the tenures of British Cochin, said that the twenty year leases of Mr. Conolly contained no resumption clause. This statement is traversed by the present Collector, who shows that it is incorrect.

†† Letter, dated 2nd June 1858.

9. Up to 1860, the total sum realized by the Betutnad escheat sales amounted to Rs. 2,14,984, and upon review of the Collector's report of operations up to that date, the Government ‡‡ authorized, at the Board's suggestion, the issue of *puttas* to indigent occupants who by reason of poverty were unable to purchase the jenm title.

‡‡ G.O., 6th December 1860, No. 2327.

10. In 1862,§§ the Collector Mr. Grant made proposals, which the Board supported, for extending the plan of selling jenm right to all escheats in the district, and in the following year the Board ‖‖ repeated the recommendation.

§§ Board's Proceedings, 24th April 1862, No. 2598.

‖‖ Board's Proceedings, dated 8th January 1863, No. 98.

11. In 1867, Mr. Ballard proposed to revise the Cochin valuation, but the Board¶¶ declined altogether to reconsider the Deputy Collector's settlement, which they regarded as moderate and "the principles of valuation to be in perfect accordance with local usage."

¶¶ Proceedings, dated 4th June 1868, No. 4129, and 23rd November 1868, No. 8264.

12. In connection with certain petitions*** by occupants of these lands, a report was sent to the Secretary of State, who, upon a suggestion formerly made by the Board, recommended the Madras Government ††† to consider a plan by which the tenants might postpone payment of the purchase-money of the jenm right, paying meanwhile 5 per cent. on the amount, with the option of redeeming this annual payment at twenty years' purchase and so acquiring the absolute title.

*** Board's Proceedings, dated 11th July 1870, No. 4815, contain a summary of correspondence regarding escheats in Malabar by Mr. McC. Webster.

††† G.O., 24th February 1871, No. 338.

13. This system was adopted by Government * for application to all escheat lands in Malabar and Cochin, and is that now in force. Bonds are duly executed to Government by the tenants and signed by the Secretary to Government, Revenue Department.

* G.O., 17th October 1872, No. 1434.

14. The long and interesting report by Deputy Collector Karanakara Menon, forwarded with the Collector's letter read above, seeks to reopen questions thus shown to have been fully discussed and long ago settled. These questions are practically two in number—

(1) Is the mode of valuation of the jenmm right a fair one?

(2) Is the present system of realizing its value a good one or the best possible?

15. To both questions the Deputy Collector replies in effect in the negative, and states his opinion that Government should not sell or part with its proprietary right, but should enhance the land assessment by a sum representing the janmabhogam. He considers the valuation of the jenm is too high and should be reduced; and lastly, if the jenm title is to be alienated, he would commute the payment for it into a rental redeemable at twenty or twenty-five years' purchase.

16. Regarding these opinions, the Board are not at present prepared to make recommendations to Government. They are aware that under G.O., dated 29th January 1884, No. 53, Political, a Committee has been appointed to consider Mr. Logan's report upon the land tenures of Malabar, and they venture to think, should Government be disposed to reopen the questions involved in this correspondence, that the matter would come within the scope of the Committee's inquiries, and they accordingly submit the Collector's letter to Government with the suggestion that it be referred for the consideration of the Committee.

(True Copies and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department, with copy of Board's Proceedings, 5th February 1883, No. 319.

Copy to the Collector of Malabar.

Read—also the following Proceedings of the Board of Revenue, dated 28th April 1884, No. 1439 :—

Read—again the following Proceedings of the Board of Revenue, dated 5th February 1883, No. 319.

Abstract.—Requesting the opinion of the Government Pleader whether the suits proposed to be filed by the Collector of Malabar for the ejectment of certain contumacious tenants of Cochin taluk, who refuse to accept the terms imposed by Government, are likely to prove successful.

Read—again the following Proceedings of the Board of Revenue, dated 15th November 1883, Mis. No. 9487 :—

Read—the following letter from C. A. GALTON, Esq., Acting Collector of Malabar, to the Secretary to the Board of Revenue, dated Calicut, 8th October 1883, No. 4119 :—

Referring to the Proceedings of the Board of Revenue, Nos. 2620 and 5717, dated the 28th March and 7th July last, respectively, I have the honor to forward herewith the following papers :—

(1) A precis of important orders issued by Messrs. Conolly and Robinson regarding the settlement of Cochin from 1844 to 1858.

(2) Translation of a specimen kychit prepared by Mr. Conolly in 1847 to be taken from lessees of pattams.

(3) Translation of certain kychits taken from lessees of pattams (leaseholds) in 1836, 1845, 1848 and 1858.

(4) Translation of certain pattas issued in 1857 by Mr. Robinson to lessees of pattams.

2. The delay in furnishing the report is due to the fact that the information had to be gathered from a number of papers discovered in the huzur and taluk record rooms after a long search, and that no connected narrative of what occurred, or leading order explaining the change introduced, has been traced. In fact, the change was made gradually as leases fell in, and the Collector's Sheristadar appears to have been deputed to carry it out on the spot, which accounts for the paucity of records on the subject.

3. In Board's Proceedings, dated the 5th February last, No. 319, it is stated that Mr. Conolly had conferred "permanency of tenure" on the occupants of Government lands in Cochin. This statement is evidently based on Mr. Robinson's report on the Revenue administration of British Cochin, dated the 2nd June 1858, No. 82A, referred to in the Board's Proceedings, dated 1st July 1858, No. 2279.

4. An examination of the papers now submitted will, however, I think, convince the Board that Mr. Robinson was in error in reporting that the ryotwari settlement introduced into Cochin by means of leases had not provided that, if required, the land should be relinquished by the lessees (paragraphs 8 and 9), and that Mr. Conolly had retained 20 years as the period for the revision of leases (paragraph 10).

5. The actual state of affairs in Cochin appears to have been this: the pattams or leaseholds were leased by auction for 20 years (not 21 years as stated in Board's Proceedings, No. 319, dated 5th February last) to the highest bidder; he sublet the estate to a number of tenants who were rack-rented and otherwise harassed by him. At the expiration of the lease the land reverted with all improvements, for which no payment was made to Government, who were at liberty to lease it again by auction—a procedure which inflicted great hardship on tenants inasmuch as they lost their improvements and had to enter into fresh agreements with the incoming lessee.

6. This system of lease by auction, the tendency of which was obviously to impoverish the actual cultivating tenant, was abolished by Mr. Conolly, who substituted another, by which a fair rental was fixed by a responsible officer on each estate, which was then leased to the resident tenants or ryots according to the extent of their holding, instead of to a single farmer or middleman. The tenants thereupon executed kychits to Government embodying the conditions of the lease and pattas were issued to them in return. The terms of the kychits and pattas will be found in the translations submitted.

7. It is this system of lease entered into by Government *direct* with the resident tenants of the pattam, or in a word the direct engagement with the ryots, that has been called the "ryotwari settlement" of Cochin. This expression has apparently led the Board to the conclusion that the ryotwari settlement of Cochin is on all fours with that prevailing elsewhere. But such is clearly not the case. The settlement consisted merely in the grant of leases by Government to tenants in Cochin, who undertook to pay a rental, out of which Rs. 42-10-8 per cent. was credited to land revenue in the accounts, and Rs. 57-5-4 per cent. to janmabhogam or proprietor's share. Several incidents to the Cochin ryotwari settlement as explained by Mr. Robinson, such as the taking of engagements from the ryots, payment of rents in advance, &c., show that the measure was something different from the ordinary ryotwari settlement and is not correctly described by such an expression.

8. That Mr. Robinson was incorrect in saying that the leases to the tenants of Cochin did not contain any "resumption clause" clearly appears from the translations of the kychits and pattas submitted herewith, some of which were taken and issued when he was Collector of the district. I have had a number of kychits* examined, all of which were found to provide for the resumption of the land covered by them "should the Sirkar require it."

* A list is submitted.

9. Nor can I find any authority for Mr. Robinson's statement that the leases were intended to be renewed every twenty years. Neither the kychits nor the pattas contain any stipulation to that effect.

10. The chief distinction between the old kychits entered into prior to 1847 and subsequently consists in the condition as to payment of the value of improvements and prohibition against transfers without permission in the later ones.

11. On a consideration of all these circumstances, the Board will, I think, be convinced that the Government are not barred from evicting the Cochin tenants by the settlement introduced by Mr. Conolly and continued by Mr. (now Sir) W. Robinson. If, in addition to the translations of kychits and pattas now submitted, the Board should wish to have translations of any of the orders mentioned in the abstract, I will furnish them without delay.

Resolution—dated 15th November 1883, Mis. No. 9487.

Communicated to the Government Pleader, with reference to his letter, dated 25th September 1883, No. 330.

2. The papers now forwarded by the Collector show that the lands leased out to tenants under Mr. Conolly's settlement referred to in paragraph 3 of Board's Proceedings, dated 5th February 1883, No. 319, are resumable at pleasure.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Acting Secretary.

To the Government Pleader,
with eight enclosures in original, to be returned.
Copy to the Collector of Malabar.

Read—again the following Proceedings of the Board of Revenue, dated 10th March 1884, Mis. No. 2203 :—

Read—the following letter from H. H. SHEPHARD, Esq., Government Pleader, to the Secretary to the Board of Revenue, dated 26th February 1884, No. 63 :—

With reference to the letter, No. 444-*b*, dated 29th January 1884, from the Collector of Malabar, I have the honor to state that I have forwarded to him a draft plaint to be filed against one Paiylo.

2. I herewith forward copies of my letter to him and the plaint, for the perusal of the Board.

Enclosure No. 1.

From H. H. SHEPHARD, Esq., Government Pleader, Madras, to the Collector of Malabar, dated 13th February 1884, No. 41.

With reference to your letter, No. 444-*b*, dated 29th January 1884, I have the honor to say that there seems to be no difficulty about the particular case for which you have drafted a plaint, except in the matter of notice. It has been held by the Courts that a lessor before determining a lease and resuming possession is bound to give a reasonable notice, and by the transfer of Property Act, Section 106, a six months' notice expiring with the end of a year of the tenancy is required. Although the present case may not be governed by the Act, I think it would be safer to follow it, unless, according to some local usage, some other or shorter notice is prescribed. I have drafted a plaint accordingly, omitting reference to the proposed sale of the janmam right which appears to me irrelevant.

I return the papers.

Enclosure No. 2.

On the 11th August 1857, certain lands known as the Maliyakkalia paramba and more fully described in the schedule hereto, being the janmam property of Government, were leased to one Paiylo Varki on the terms stated in a kychit of the same date executed by him.

Since the 11th August 1857, the said Paiylo Varki, and, after the death, his son the defendant, has held the said lands on the terms stated in the said kychit.

On the day of , the plaintiff by his agent served a notice on the defendant requiring him, on the expiration of six months from the date thereof, to relinquish and deliver up to him the said lands on payment of the value of improvements as by rate sanctioned by local usage; but the defendant in breach of the terms contained in the said kychit has refused so to do.

Resolution—dated 10th March 1884, Mis. No. 2203.

The Collector of Malabar is requested to state to what case the draft plaint forwarded by the Government Pleader refers, as the matter does not appear to have been reported to the Board.

(True Copies and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Collector of Malabar.
Copy to the Government Pleader.

Read—also the following letter from C. A. GALTON, Esq., Acting Collector of Malabar, to the Secretary to the Board of Revenue, dated Calicut, 19th March 1884, No. 1377:—

With reference to the Proceedings of the Board of Revenue, No. 2203, dated the 10th instant, I have the honor to inform you that the draft plaint forwarded by the Government Pleader refers to the escheat case at Cochin alluded to in paragraph 12 of Mr. Burrows' letter embodied in the Proceedings of the Board of Revenue, No. 319, dated 5th February 1883. At the request of Mr. Shephard, to whom the case was referred by the Board for opinion, a draft plaint was furnished to him by me; it was revised and returned to me with his letter, No. 41, dated the 13th ultimo. In my letter, No. 888, dated the 23rd ultimo, I informed Mr. Shephard that the draft plaint should be submitted to the Board for orders as the whole matter was pending before them. The Government Pleader has accordingly submitted the plaint and correspondence for orders of the Board.

Resolution—dated 28th April 1884, No. 1439.

Submitted for the orders of Government, in continuation of Board's Proceedings, dated 16th February 1884, No. 542.

2. In his letter printed in Board's Proceedings, dated 5th February 1883, No. 319, Mr. Burrows, when Acting Collector of Malabar, brought to notice that of the 390 persons who purchased the janmam right of Government in the lands in Cochin Taluk, of which the Government was absolute owner, for a sum aggregating Rs. 2,93,583, only thirty-two had paid the janmam value amounting to Rs. 10,220 out-right, that 76 other persons had executed bonds for the payment of interest on Rs. 42,458, and that for the remaining sum of Rs. 2,40,904, the parties concerned have refused to come to terms; and he recommended that suits should at once be brought to eject the recusant tenants, as, if it is seen that the Government are earnest about the enforcement of their rights, most of the tenants would soon pay up.

3. The Board agreed with the Collector as to the necessity for adopting stringent measures, but, having regard to a statement made by Sir William Robinson in his report in 1859 that on the holders of land in Cochin Taluk had been conferred rights of permanent tenancy by Mr. Conolly during the years 1847-54, they requested the Government Pleader to give his opinion as to whether there would be any difficulty in prosecuting to a successful issue suits for ejectment against persons whose right of occupancy had been declared permanent by the Collector of the district.

4. The Government Pleader having called for further information on this subject, the old records connected with the case were looked up by the Collector, and it turns out that the statement of Sir William Robinson that the Cochin tenants had permanent occupancy rights is not borne out by the records, but that, on the contrary, a distinct clause was inserted in the pattas granted by Mr. Conolly to the effect that the lands could be resumed at the pleasure of Government.

5. So far then as the legal aspect of the question is concerned, there can be no doubt as to the right of Government to eject the tenants in the Cochin Taluk, and the Government Pleader has prepared and submitted for approval a draft plaint in a typical case.

6. The policy, however, of selling the janmam right of Government in the lands in Cochin Taluk and other places has recently been seriously questioned by the Deputy Collector, Karunakara Menon, whose report on the subject, the Board have requested in their Proceedings, dated 16th February 1884, No. 542, might be referred for the opinion of the Malabar Land Commission now sitting. The Board suggest that these papers which relate to the same subject likewise be forwarded to the Commission.

(True Copies and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department, with copy of Board's Proceedings, dated 5th February 1883, No. 319, 7th July 1883, Mis. No. 5717, and 28th March 1883, Mis. No. 2620.

Copy to the Collector of Malabar.
,, ,, Government Pleader.

ORDER—dated 5th June 1884, No. 706, Revenue.

Miscellaneous.

His Excellency the Governor in Council is of opinion that it is now impracticable and inexpedient to re-open the question of the policy of the Malabar escheat operations or even to make any essential change in the system of settlement. The changes proposed by Karunakara Menon could not be carried into effect in the cases which remain unsettled without a readjustment of the settlements already made, or without exciting discontent among the tenants who have accepted those settlements.

2. It appears however that something may and ought to be done to facilitate the completion of the settlement, without a departure from its essential principles. The following abstract, based upon the statements appended to Karunakara Menon's report, shows the magnitude of the escheat operations, and the extent to which settlement has progressed :—

—	Total estimate value.	Cases settled.				Cases unsettled.		
		Total sold.	Paid in Cash.	Balance unpaid.	Bonds executed out of the Balance.	Undisputed.	Disputed.	Total.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Cochin Escheats.	4,83,185	2,93,583	10,231	2,83,352	42,613	1,89,602	..	1,89,602
Other Dutch Escheats.	7,98,088	6,81,366	2,82,859	3,98,507	6,897	55,604	61,118	1,16,722
Other Escheats.	35,70,524	25,32,118	23,09,311	2,22,807	90,707	2,85,407	7,52,999	10,38,406
River Reclamation.	2,65,005	..	..	..	..	2,65,005	..	2,65,005
Total ..	51,16,802	35,07,067	26,02,401	9,04,666	1,40,217	7,95,618	8,14,117	16,09,735

3. From this statement it appears that, excluding cases in which the right of Government is disputed, the cases settled in Cochin are 60·8 per cent. of the value; that of the settled value only 3·5 per cent. has been paid in cash; and that bonds have been executed for only 15 per cent. of the balance. The corresponding ratios for the other Dutch escheats are 92·5, 41·5, and 1·7; and for the remaining escheats in the district, 89·9, 91·2, and 40·7. These figures show that, for some reason, the settlement of the Cochin escheats makes especially little progress; and the Government think that the reason is the over-valuation now alleged, not for the first time. Karunakara Menon does not explain how the jenmabhogam estimated by him at alleged customary rates is arrived at; but if it is represented by the figures in columns 4, 11 and 18 of Enclosure 2, it would seem to be about a fourth of the sums payable annually as interest under the bond system.

4. Without at all accepting his valuation, which possibly errs more on the side of leniency than did those made by Messrs. Kannan and Kanaran on the side of excess, His Excellency in Council thinks that it may be expedient to grant some relief in the Cochin cases in view to expediting the completion of the settlement, and inducing the tenants to come to terms. He is disposed to think that the best way of doing this would be to make an arbitrary all round reduction, say 25 per cent., on the existing rent-valuation, fixing a time within which the offer should be open to the tenants' acceptance. If within such time a tenant does not signify his acceptance and either pay in cash or execute the prescribed documents, steps should be taken to enforce the right of Government. But before passing final orders to this effect, the Government desire to have before them the views of Mr. Logan, to whom the papers will be referred for report through the Board of Revenue. The plaints submitted with Board's Proceedings, 28th April 1884, No. 1439, should lie over till it is decided whether revised terms shall be offered to the Cochin tenants.

5. The Government observe that it is stated in Karunakara Menon's report (paragraph 43) that 25 times the annual rent or jenmabhogam has been taken as the jenmam value; in other words that the jenmabhogam has been capitalised at 4 per cent. interest. But the interest charged under the bond system is five per cent. on the amount so obtained; and the result is that the annual payment required under the bond system is one-fourth greater than the estimated rent. It is not quite clear from the papers at what rate the jenmabhogam has been capitalized in other parts of the district, but the Government gather from expressions in the correspondence relating to escheats that the estimated jenmam value was 20 times the rent, and it is certain that in Anjengo and Tangachéri * this was the case. From the Secretary of State's despatch, 22nd December 1870, No. 33,† suggesting the annual interest system, the intention seems to be that the annual payment in interest shall be the same as the estimated rent; and this will of course be the case if the rent is capitalized and interest levied at the same rate, unless there is a capital value on account of tenants' improvements to be set against the capitalized value of the estimated rent.

* G.O., 19th May 1869, No. 1390.

† G.O., 24th February 1871, No. 338.

6. The considerations stated in the preceding paragraph furnish a further reason why the Cochin settlements are so reluctantly accepted by the tenants; and if Karunakara Menon's statement in paragraph 43 is correct, relief on account of the capitalization at 4 per cent. should be given in addition to the general reduction in the valuation referred to in paragraph 4. In fact, relief should be given in all cases, settled or remaining for settlement, when 5 per cent. interest is charged on a rental value capitalized at 4 per cent. The Government desire to have a special report from the Collector on this point.

7. It is observed that very little progress has been made in the Malabar escheat settlements during the last twelve years. In Mr. MacGregor's report recorded in G.O., 17th October 1872, No. 1434, the amount of settlements effected was given as Rs. 34,30,000, of which Rs. 22,20,301 had been paid; and, according to the instalments fixed, the balance Rs. 12,09,699 should be now paid off all but about Rs. 4,000.

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The sales since then have been only Rs. 77,067, and the collections only Rs. 3,82,100. Thus it appears that there must be some 8 lakhs ‡ of rupees due as instalments under the old system of settlement still outstanding, and realizable only by a sale of the jenmam right entailing, it is believed, forfeiture of instalments which may have been already paid. This is an unsatisfactory state of things, and to avoid the harsh measure of a sale of the jenmam right in these cases, it would seem advisable to apply a remedy by changing the mode of settlement so as to substitute for the principal sums still due an annual payment with, of course, option of redemption. The Board will obtain and submit a report on this subject.

‡ The bulk of this, probably 6 lakhs, is due on the Dutch escheats.

8. No information is available as to the realization of interest due on instalments outstanding or due under the bond system initiated in 1874. It was anticipated at the time that there might be some difficulty in collecting interest without recourse to Act II of 1864, and the point is referred to by Karunakara Menon, who prefers the system of adding the jenmabhogam or other annual payment to the assessment. The Government desire to be informed whether the interest has been punctually collected and whether difficulty has been experienced owing to the want of summary process. A demand, collection and balance statement, showing interest collected and outstanding for each year, should be furnished. If there is difficulty in recovery, it would be better to provide for the annual payment by an addition to the assessment.

9. The progress of the escheat operations in Malabar seems to have been very unsatisfactory, and to have received less attention than it ought, in recent years. In more than half of the cases still unsettled, the right of Government is disputed; and steps should at once be taken to clear up this question, and either to strike off the cases, abandoning the Government claim, or to assert the claim by suit. It is presumed that the escheat establishment has, during the years which have elapsed since operations began, collected full information regarding all these cases; and the Collector should now be in a position to report upon them. They probably fall into a few broad classes, and if Government decide to prosecute its claims, a very few suits in typical cases would suffice to dispose of the whole 5,208 disputes; of which, it is observed, 4,737 appertain to Betutnad and Chenat Nair's escheats. The Board will issue the necessary instructions in this matter.

10. The Government do not understand what the River reclamation cases, valued at Rs. 2,65,005, are. If these, as the name implies, refer to lands reclaimed from river beds by works carried out at the expense of the tenants, the Government question the justice of asserting the claim of the State to them; and if the lands are accretions formed by alluvion, His Excellency in Council does not see why the ordinary principle under which they should belong to the riparian owner, should not apply. Explanation should also be furnished on this point.

11. The Government desire to see this long-pending settlement brought to a speedy close, and they trust that the Board will not lose sight of the matter in future.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

80 Copies.

Ind No. 1856/84

Govt. of {1884} Madras.

REVENUE.

No. 2070/119

Communicated to the officers in charge of Settlement Parties

(By order)

Seagwah

1st Assistant

Deptt of Rev: Sett & Agriculture }
Madras 25th June 1884 }

To

The Dy: Director, Party No. III

Exd. [illegible]

Issued

Recd. *Encl.*

G.O., 5th June 1884, No. 706.

JUNE.

Escheats in Malabar.

Passing orders on certain modifications proposed in the system of settlement of —.

11TH JUNE 1884, No. 734, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 16th January 1884, No. 125 :—

Read—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to the Secretary to Government, Revenue Department, dated Madras, 23rd November 1883, No. 3014-64 :—

I have not, till quite lately, seen my way to submitting, as directed in G.O., No. 312, dated 2nd March 1883, any proposals for the localization and demarcation of mamool wet lands irrigated from Government works in zemindari and other proprietary estates that would satisfy the purpose that such localization and demarcation are intended to serve, viz., to get rid of the necessity for the yearly measurements that are now required.

2. Of course a survey was possible, but a survey is useless unless supplemented by a continuous village record of irrigation, and the provisions of the Zemindari Curnams' Regulation XXIX of 1802 make it impossible to compel the maintenance of such a record.

3. I at one time thought the difficulty might be overcome by supplying estates with water for irrigation by volume, but I had to abandon the idea when Colonel Hasted informed me that the works were not in a condition to make this possible now, and probably never would be in a condition to make it possible at all.

4. The recently-proposed repeal of Regulation XXIX of 1802 and amendment of the law relating to zemindari curnams is a measure which has opened the way to what I consider, the only possible solution of the problem, viz., a detailed survey of the zemindari villages which are irrigated from Government works supplemented by a continuous and compulsory village record of irrigation and a system of inspection as in Government villages. The provisions of the bill make the maintenance of the record a matter of no difficulty, while inspection can be provided for from the 10 per cent. allowance made to zemindars for the trouble of collecting the Government revenue. Hitherto this allowance has been simply paid to zemindars, and Government has never thought it necessary to inquire how it was expended. The primary and main purpose of the allowance is to meet the cost of collection, and the fund should therefore properly be spent only on the establishments necessary for this purpose. Inspection is a very necessary part of the machinery of collection, and I would submit, for the consideration of Government, that the 10 per cent. allowance should be no longer simply handed over to zemindars to be used as they please, but that it should be controlled by Collectors and expended under the orders of Government in the remuneration of village officers, the provision of inspection and the payment of such extra office establishments as increased revenue and increased work may render necessary.

5. It need hardly be said that there are no legal obstacles in the way of a survey. Government may order the detailed survey for revenue or other purposes of zemindari as it may of its own lands.

6. The question is what method of survey should be adopted; whether the scientific method adopted for Government villages or the rougher method of khusrah or a combination of the two.

7. The khusrah method is practically the pymaish or curnam survey, that is to say, the method of survey which it was found necessary to supersede in Government villages by the present scientific one. It may be dismissed, I think, from consideration, for it is quite certain that if on any considerable scale its results could never be plotted nor mapped; the khusrah method can be safely adopted only where the areas to be measured are small; 50 acres is perhaps the maximum area of a block that could be measured by the rough khusrah method without the risk of considerable error.

8. It might be possible however to combine the scientific with the khusrah method by having village and khandam boundaries laid down by the former and leaving the field measurements within the khandams to be done by the latter.

9. The only alternative is detailed survey by the scientific method and the question as to which method should be adopted must be determined by consideration of cost.

10. I enclose a statement (enclosure No. 1) prepared in the Survey office from which it appears that to lay down the boundaries of villages and of 50-acre khandams would cost, with computation and mapping, Rs. 212 a square mile if offset stones are supplied by Government and Rs. 152 a square mile if the offset stones are supplied by the ryots.

The cost of the measurement and mapping of the fields within the khandams would be Rs. 138 a square mile, whether it were done by this department or by the survey, so that the total cost of a combined scientific and khusrah field, khandam and village survey would be Rs. 350 a square mile if Government pays for the offset stones and Rs. 290 a square mile if the ryot does. The scientific Survey Department by taking larger khandams and thus reducing their number and consequently theodolite work could do the whole work for Rs. 230 a square mile at the outside if offset and field stones were, as they should be, found by the ryots. It would be cheaper therefore to let the scientific department do the whole work.

11. The question now comes, what is the work to be done? For the present it will suffice to answer "a field survey of all zemindari villages which are irrigated from Government works."

12. From the accompanying statement No. 2, it will be seen that there are $596\frac{1}{3}$ square miles of irrigable land in the zemindaris of the Godávari that are commanded by the Kistna and Godávari anicuts, and that of this extent $148\frac{3}{4}$ square miles have been acknowledged by Government to be entitled to free irrigation; of this free land $101\frac{3}{4}$ square miles are zemindari and 47 square miles are inam. Of the total irrigable area, $403\frac{5}{6}$ square miles is the actual area as ascertained by block survey, the remaining area of $192\frac{1}{2}$ square miles is approximate—taken from the late census tables. Taking the area to be surveyed in round numbers as 600 square miles, the cost, at Rs. 230 a square mile, would be Rs. 1,38,000. The boundaries of many villages are already laid down by reason of their marching with those of Government villages that have been already surveyed and the cost would be *pro tanto* reduced, but I have no means of determining what the probable saving would be.

13. In the Kistna again the irrigable area (survey and approximate) in zemindaris commanded by the channels is $469\frac{1}{4}$ square miles. The extent of this that is entitled to free irrigation has never yet been officially declared, but in 1882-83 the extent actually irrigated free of charge was $37\frac{1}{2}$ square miles, of which $18\frac{1}{2}$ were zemindari and 19 were inam. Taking the area for survey at 470 square miles, the cost, at Rs. 230 a mile, would be Rs. 1,08,100, so that the 1,070 square miles to be surveyed in the Kistna and Godávari would cost Rs. 2,46,100.

The establishments maintained for the present unsatisfactory method of yearly measurement cost for the Kistna Rs. 1,380 and for the Godávari Rs. 854 a year, or Rs. 2,234 in all.

14. Supposing a survey determined on, how is the money—nearly $2\frac{1}{2}$ lakhs—to be provided for it? There is, I think, a very legitimate way of getting it, though legislation would probably be necessary to enable us to adopt it. While supplying free

irrigation to zemindari lands, the supply of which we have superseded, we *have relieved zemindars of all charge for maintaining the works that supply it;* but as they were bound to maintain their own works, so are they bound to contribute to the maintenance of our works that have superseded theirs. I have already indicated to what purposes the 10 per cent. allowance on the charged area should, in my opinion, be devoted. I now say that zemindars are bound to contribute to the maintenance of the Government works which supply their *free* areas. Taking the rates of contribution at the rates determined for the Kistna and Godávari works, viz., 12 annas and 8 annas per acre of occupation, we should have—

(1) For the Godávari—

	RS.
148¾ square miles or 95,232 acres of sanctioned free irrigation at 8 annas an acre	47,616

so that on this basis the cost of the Godávari survey, Rs. 1,38,000, would be repaid in three years.

Basing our calculations on the free area actually irrigated, we have on the figures of 1882-83—

	RS.
117 Square miles or 75,037 acres, at 8 annas an acre	37,518

which would pay the cost of survey in four years.

(2) For the Kistna—

We have no knowledge yet of the area that may be eventually held to be entitled to free irrigation, but basing our calculations on the free area actually irrigated in 1882-83, we have 37½ square miles, or acres 24,006, at 12 annas an acre, = Rs. 18,005, so that from this source the survey cost, Rs. 1,08,100, would be repaid in six years.

15. I have included the area of free inams in zemindaris in the area chargeable for maintenance, for they formerly received their supply from works which the zemindars were bound to maintain.

16. There can be no difficulty in localizing and demarcating mamool wet lands in zemindaris; where they can be identified from the records, there is no difficulty at all, and where it may be impossible, as it is so often now said to be impossible to do this, an area equal to the area acknowledged to be free may be arbitrarily determined and permanently marked; but there is no use in localizing and demarcating the mamool wet areas only, for what we want to get rid of is the necessity for yearly, and it is to be feared too often very imperfect, surveys by a scientific and permanent survey, supplemented by a continuous village record of cultivation and irrigation in zemindari as in Government villages, and it is obvious that even if the mamool wet areas were localized and demarcated, we would without a permanent survey and a continuous record of irrigation still have to measure year by year the large and ever-changing area of dry lands converted into wet or casually irrigated.

ENCLOSURE No. 1.

ESTIMATE of cost of Boundary and Khandam Demarcation and Survey of a Block of 50 acres.

Boundary and Khandam Demarcation of a Block of 50 acres.

	RS.	A.	P.
Cost of labor—			
1 Boundary Demarcator, at Rs. 15 per mensem, for one day	0	12	0
1 Deputy Surveyor, at Rs. 30 per mensem, for ½ day	0	6	0
Total ...	1	2	0
Cost of stones—			
3 Boundary stones, at 12 annas. 2 4 0			
3 Khandam stones, at 6 annas. 1 2 0			
25 Offsets, at 3 annas 4 11 0			
	8	1	0
Total ...	9	3	0

In a village consisting of nearly 300 acres.

Number of Khandams.	Stones. Boundary.	Khandam.	Offset.
1st	6	4	31
2nd	3	3	31
3rd	6	2	19
4th	...	4	9
5th	3	1	15
6th	3	...	17
Total ...	21	14	122
Per Khandam	3	3	25

Boundary and Khandam Survey of a Block of 50 acres.

	RS.	A.	P.
Cost of labor—			
1 Boundary Surveyor, at Rs. 40 per mensem, for half-a-day	1	0	0
6 Peons, pay Rs. 36 per mensem, for half-a-day	0	14	0
Total ...	1	14	0
Cost of labor—			
Computation and Mapping	1	4	0

Cost of a Block of 50 acres.

	RS.	A.	P.
Cost of Boundary and Khandam Demarcation	1	2	0
Do. do. Survey	1	14	0
Do. Computation and Mapping	1	4	0
Do. Supervision	4	4	0
Do. Stones	8	1	0
Cost per 1 block or 50 acres	16	9	0
Cost per 13 blocks or 640 acres or 1 square mile	212	0	0

	Rate per Square Mile. RS.	RS.
1. If offset stones are not paid for by ryots, the cost of outline survey required by the Settlement Department will be	212	
Field Survey and Mapping	138	350
2. If offset stones are paid for by ryots, the cost will be (Rs. 212 — Rs. 60, cost of offset stones)	152	
Field Survey and Mapping	138	290
3. If offset and field stones are paid for by ryots and revenue survey is made by this department, the cost will be		* 230

* This is the cost per square mile of Cuddalore Taluk work last year and is high.

The difference in cost between a survey made by this department *in toto* and that partly made by settlement and partly by Survey Department is owing to the block having to be cut up into small khandams to enable untrained measurers and draftsmen to close their work—

	Per Square Mile. RS.
The extra cost on stones	30
The extra cost on Survey and Mapping	30

21st November 1883. (Signed) C. C. SARGEAUNT, Colonel,
Deputy Superintendent, Madras Survey.

Enclosure No. 2.

Statement showing the Ayacut and Actual Cultivation in Zamindári and Inam Villages irrigated under the Godávari and Kistna Anicut Systems.

Items.	Total Ayacut of Villages irrigated by Anicut Channels.		Seri.						Inam.						Total Irrigated.	
			Free.				Charged.		Free.				Charged.			
			Sanctioned.		Actually irrigated in Fasli 1292.				Sanctioned.		Actually irrigated in Fasli 1292.					
	Acres.	Square Miles.	Acres.	Square Miles.	Acres.	Square Miles.	Acres.	Square Miles.	Acres.	Square Miles.	Acres.	Square Miles.	Acres.	Square Miles.	Acres.	Square Miles.
Godavari.																
Zamindari.																
Pithápuram	119,362	186½	25,657	40	16,460	25⅔	12,448	19⅓	7,792	12	7,292	11⅓	6,239	9¾	42,439	66¼
Nidadavól	98,891	154½	25,881	40½	25,881	40⅓	8,534	13⅓	6,733	10½	4,861	7¼	4,714	$7\frac{7}{12}$	43,990	68½
Other Minor estates	100,032	156⅓	13,582	21¼	9,953	15½	5,887	9¼	4,487	7	2,697	4¼	5,057	8	23,594	37
Total ..	318,285	497⅓	65,120	101¾	52,294	81½	26,869	$41\frac{11}{12}$	19,012	29½	14,850	23	16,010	25⅓	110,023	171¾
Whole Inam villages	63,403	99	..	..	..	..	..	..	11,100	17½	7,893	12½	11,973	18½	19,866	31
Total, Godávari District ..	381,688	596⅓	65,120	101¾	52,294	81½	26,869	$41\frac{11}{12}$	30,112	47	22,743	35½	27,983	43⅚	129,889	202¾
Kistna.																
Zamindari.																
Núzvíd	118,016	184¼	..	..	6,717	10½	15,535	24¼	..	..	861	1¼	2,970	4¾	26,083	40¾
Devarakót	40,000	62½	..	..	1,482	2½	3,150	5	..	..	..	..	16	..	4,648	7½
Gúdúr	38,885	60¾	..	..	..	..	7,887	12¼	..	..	2,709	4¼	90	..	10,686	16½
Other Minor estates	29,113	45½	..	..	3,519	5½	1,919	3	..	..	490	¾	378	½	6,306	9¾
Total ..	226,014	353	..	..	11,718	18½	28,491	44½	..	..	4,060	6¼	3,454	5¼	47,723	74⅓
Whole Inam villages	74,419	116¼	..	..	..	..	..	..	..	..	8,228	12¾	10,394	16¼	18,622	29
Total, Kistna District ..	300,433	469¼	..	..	11,718	18½	28,491	44½	..	..	12,288	19	13,848	21½	66,345	103½

(Signed) W. WILSON,
Dir. of Rev. Sett. and Agri.

Madras,
23rd November 1883.

Mis. G.O., No. 5133.

Referred to the Board of Revenue for remarks.

(By Order.)

FORT ST. GEORGE,
28th December 1883.

(Signed) E. S. LAFFAN,
Ag. Under Secy. to Govt.

Resolution—dated 16th January 1884, No. 125.

In G.O., 2nd March 1883, No. 312, Government, upon a suggestion of the Board, instructed the Director of Settlement to submit proposals for localizing and demarcating the Mámul wet areas in the Zamindári and Inam villages of the Godávari and Kistna deltas. Mr. Wilson now replies to the Government Order and Government refer his letter to the Board for remarks.

2. After discussing the general question involved in the subject and the relative merits of the several possible forms of survey, recording his opinion in favor of a scientific survey in detail by the Survey department, the Director proceeds to estimate the cost and to deal with the question how funds are to be provided.

3. As regards cost, he calculates that in *Godávari* the expenditure entailed may be put down at Rs. 1,38,000, and in Kistna at Rs. 1,08,100.

4. To meet this cost, the Director, arguing that Zamindárs, whose old irrigation works have been superseded by the anicut systems, can fairly be required (by the legislation) to pay an acreage contribution on their free (Mámul wet) areas towards the upkeep of Government works, recommends an 8 annas rate for Godávari and a 12 annas rate for Kistna, and calculates that at these rates the cost of survey would be covered in from three to six years.

5. The Board agree with the Director that the whole work should be entrusted to the Survey department, the cost per square mile (the ryots finding the stones) being estimated at Rs. 230.

6. As regards the provision of funds, the Board can see no relation between a liability on the part of Zamindárs to contribute towards the upkeep of the State irrigation works which have superseded their own, and a liability to pay for a survey which Government wish carried out for statistical or revenue purposes. There is no objection, in the Board's opinion, to levying the proposed cess for the upkeep of the irrigation works; but once levied, it should be a fixed charge and be credited to irrigation revenue. The Government might, of course, decide to pay for the survey out of this revenue, but there is no equity in imposing the cess, as a fixed charge, merely for this purpose. If imposed for that object (and there is no reason why it should be), it ought to cease when the survey is completed.

(True Copies and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department, with original letter and endorsement returned.
,, the Director of Revenue Settlement and Agriculture.

Copy to the Collector of the Godávari district.
,, ,, ,, Kistna district.

ORDER—dated 11th June 1884, No. 734, Revenue.

Land Revenue, No. 80.

The Right Honorable the Governor in Council has given the subject his careful consideration, and the conclusion at which he has arrived is that, to insure the realisation of the water-rate on Zamindári and Inam lands which are not entitled to free irrigation, a field survey and register of lands irrigated from or commanded by Government sources are essential. He also agrees with the Director of Revenue Settlement in thinking that a detailed survey by the scientific method is the most economical as well as the best adapted for the purpose in view, and considers that this should be taken in hand with as little delay as possible.

2. The Superintendent, Revenue Survey, will report, through the Board of Revenue, the arrangements necessary to give effect to this measure, and he will also state within what time the work can be completed and what provision of funds will be required during the current official year.

3. The Government are not prepared to entertain the proposal to impose a maintenance cess on the Mámul wet areas. The Zamindárs and Inámdárs had no option given them as to keeping up the old works or obtaining irrigation from the new works by which they were superseded; and the Government having for their own purposes put it out of the power of the proprietors to fulfil the obligation to maintain the old works, cannot now impose upon them in lieu of it an entirely new, and (at the proposed acreage rate) an undoubtedly more onerous liability. Moreover, it is to be observed that, during the prolonged discussion relating to the settlement of water-rate for lands newly brought under irrigation and to the concession of free irrigation for Mámul wet, no question was raised as to making the latter subject to a contribution for the cost of maintenance of works; and most of the reasons urged by the Board of Revenue against the special rate at first ordered for old wet lands (G.O., 16th January 1864, No. 101) seem to Government to be fully applicable to the present proposal. The principle that these lands should get for nothing whatever other lands get for the water-rate is established in the order quoted.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
„ the Superintendent, Revenue Survey.
„ the Director of Revenue Settlement.

Exd. P. L. Pereira.

80 Copies.

In No. 1896/84

Govt. of (1884) Madras.

REVENUE.

J. 2185/127

Communicated to the officers in charge of settlement parties

(By order)

[signature]

1st Assistant

Deptt of Rev. Sett & Agriculture }
Madras 5 July 1884 }

To

The Dy. Director, Party No. II

Exd [illegible]

Issued

Recd. Encl.

G.O., 11th June 1884, No. 734.

JUNE.

Survey of Zamindari and Inam Villages

in Godávari and Kistna districts.— Passing orders on certain points connected with the proposed — for the purpose of the water-rate.

9-7-84 82

18th June 1884, No. 760, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from Colonel H. T. Rogers, R.E., Superintendent, Madras Survey, to the Secretary to Government, Revenue Department, dated Madras, 29th May 1884, No. 114-G :—

I have the honor to request you will be so good as to furnish me, for reference, with a copy of G.O., No. 1694, dated 1st December 1879, Public Department, ruling that Heads of Departments are competent without seeking sanction of Government to retain in the service men who have attained the age of 55 years and who continue to perform efficient service up to their attaining the age of 60.

Read—the following G.O., dated 1st December 1879, No. 1694, Public :—

Read—the following letter from Her Britannic Majesty's Consular Agent, Pondicherry, dated 14th November 1879, No. 170 :—

I have the honor to bring to the notice of His Grace the Governor in Council that Mr. E. D. Quintval, Head Clerk of Her Britannic Majesty's Consulate, has attained his 55 years of age on the 13th instant, and I am informed by the Accountant-General that the 55 years' rule is applicable to my establishment inasmuch as its pay is a Government charge.

2. As I consider that the clerk is fit to continue his present duties (which are not of a very arduous nature) for a further period of five years in this department wherein he has satisfactorily served for the last sixteen years, may I therefore request that His Grace the Governor in Council will take his case into consideration and sanction the extension?

Order—dated 1st December 1879, No. 1694, Public.

The Consular Agent will be informed that the reference was unnecessary. An official who has attained the age of 55, has the option of claiming his superannuation pension, but cannot be compelled to retire before 60, unless the head of his office can certify that the man is inefficient from age or infirmity to his—the head's—personal knowledge or belief; and such opinion is upheld on any appeal preferred by the person concerned.

(True Extract.)

(Signed) C. G. MASTER,
Chief Secretary.

(True Copy.)

(Signed) J. D. REES,
Acting Under-Secretary.

To the Revenue Department.

Order—dated 18th June 1884, No. 760, Revenue.

Miscellaneous.

Communicated to the Superintendent, Revenue Survey, with reference to his letter read above, and also to the Board of Revenue, the Inam Commissioner, the Director of Revenue Settlement and Agriculture, and the Director of Government Cinchona Plantations, Parks and Gardens, Nílgiris.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Superintendent, Revenue Survey.
,, the Board of Revenue.
,, the Inam Commissioner.
,, the Director of Revenue Settlement and Agriculture.
,, the Director of Government Cinchona Plantations,
Parks and Gardens, Nílgiris.

Exd. W. H. French.

80 Copies.

In No. 1941/84

Govt. of {1884} Madras.

REVENUE.

No. 2186

Issued

Recd. Encl.

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 5th July 1884

(By order)

[signature]
1st. Assistant

To The Dy: Director, Party No. II

G.O., 18th June 1884, No. 760.

JUNE.

Fifty-five years' Rule.

Government Order, Public Department, on a reference from the British Consular Agent at Pondicherry regarding the —, communicated to the Superintendent, Revenue Survey, and certain other authorities.

9-Feb-84

84

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—G.O., dated 20th May 1884, No. 141, Legislative.

Read—the following letter from D. FITZPATRICK, Esq., Secretary to the Government of India, Legislative Department, to the Acting Assistant Secretary to Government, Legislative Department, dated Simla, 3rd May 1884, No. 798:—

An Act to make further provision for the maintenance of boundary marks.

I am directed to return herewith, with the assent of His Excellency the Viceroy and Governor-General signified thereon, the authentic copy of the Bill noted on the margin, which was received with your letter, No. 100, dated the 1st ultimo, to the address of the Secretary to the Government of India in the Revenue and Agricultural Department.

Order—dated 20th May 1884, No. 141, Legislative.

A copy of the Act "to make further provision for the maintenance of boundary marks," assented to by the Governor-General, will be published in the *Fort St. George Gazette.*

2. The assent of the Governor-General to this Act will be communicated to the Council for making Laws and Regulations as prescribed by Rule 39 of the Council Rules.

3. The necessary steps will be taken in the Revenue Department for bringing the Act into operation.

(True Extract.)

(Signed) M. HAMMICK,
Ag. Asst. Secy. to Govt.

To the Revenue Department.

Order—dated 21st June 1884, No. 780, Revenue.

Miscellaneous.

The following notification will be published in the *Fort St. George Gazette.*

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.
,, Superintendent of Revenue Survey.
,, Superintendent of the Government Press.
,, Legislative Department.

NOTIFICATION.

The Madras Act No. II of 1884 (An Act to make further provision for the maintenance of boundary marks) having received the assent of His Excellency the Viceroy and Governor-General and become law, the Governor in Council, under Section 5, Act I of 1867 (Madras), hereby directs that the said Act shall come into force from the date of publication of this notification.

Exd. J. W. Fischer.

80 Copies.

In. No. 1951/84

Govt. of {1884} Madras.

REVENUE.

No. 2187

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 5th July 1884

(By order)

[signature]
1st. Assistant

To The Dy. Director, Party No. III

Issued

Recd. *Encl.*

G.O., 21st June 1884, No. 780.

JUNE.

Act II of 1884

to make further provision for the maintenance of boundary marks.—Notification declaring that shall come into force from the date of its publication, ordered to be published in the *Fort St. George Gazette.*

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 27th May 1884, No. 1777 :—

Read—the following letter from J. STURROCK, Esq., Collector of South Canara, to the Secretary to the Board of Revenue, dated Mangalore, 29th March 1884, No. 733 :—

In carrying into execution the scheme sanctioned in G.O., dated the 19th October 1882, No. 1152, Revenue Department, for the revision of the village establishment of this district, I have found reason to think that it may well be amended in some few particulars, and I have the honor now to submit detailed proposals to that effect. Wherever I went on tour after the terms of the sanctioned revision had been made public, the Shanbogues represented to me that the *minimum* rate of pay proposed by Mr. Webster, viz., Rs. 6, was unduly low, and that nothing had been done for many of the Shanbogues whose present pay was Rs. 6, 7 or 8. A petition to the same effect was also transferred to me by Government with their Order of the 11th November 1882, No. 462, and I cannot but think that the Shanbogues have fair cause for complaint. But few of them possess any appreciable amount of private property, and to men whose work is really heavy it must seem hard that they reap no benefit whatever from a scheme of which the sole object was the improvement of the position and efficiency of the village establishment.

I learn that in North Canara no Shanbogue receives less than Rs. 8 per mensem, and as I think that a similar rule may well be adopted for the district, I propose to raise the minimum salary of Shanbogues to Rs. 8 and to raise the pay of those Shanbogues who were receiving Rs. 8 or nearly Rs. 8 previous to the revision to Rs. 9 per mensem, so that they also may be benefited by the revision. The minimum of a Shanbogue's pay being thus fixed at Rs. 8, it follows that the salaries of Shanbogues in certain unhealthy maganies under the ghâts should be raised to Rs. 9.

2. As regards the Potâls, the revised scheme was so arranged as to allow only one Potail for each village, the services of all additional Potails being dispensed with. In this district, where villages vary so much in extent and importance, it is difficult to adhere strictly to a hard and fast rule of this kind in carrying out a scheme which makes no provision for reducing the size of villages or revising their boundaries, and I propose therefore to retain two Potails in twenty-eight large or important villages * which have hitherto had more than one Potail, and with regard to which it is feared that there may be difficulty in securing punctual collections if all the additional Potails are now dispensed with. A few other minor alterations have also been found necessary as explained in the remark column of Statement No. 1 accompanying this letter.

* Statement No. 2.

3. In the new scheme a uniform rate of Rs. 3 was put down for each Ugrany as their salaries varied from Rs. 2 to 3, except in the case of the marginally-named Ugranies, who used to receive the higher salaries noted opposite their respective names. I think that the pay hitherto drawn might, in these cases, be continued during the life-time of the present incumbents, the excess charge being met from the savings.

	RS.	A.	P.
Ugrany of village No. 17 in Magany No. 46 of Mangalore taluk ...	3	3	2
Ugrany of the 4th Tarf of the said Magany	4	13	2
Ugrany of the 3rd Tarf of Magany No. 21 of Kásaragód taluk ...	3	2	0

4. To facilitate the work connected with supplies, an additional Ugrany was allowed to each of the Potails on whom much duty of that kind devolves, but no special provision was made as regards the Mangalore town, where the work used to be done by the taluk peons. It is now brought to notice that taluk peons cannot be spared for this duty without detriment to their legitimate work, and it is, therefore, necessary to employ five additional Ugranies in order to afford relief to the taluk staff. Provision has accordingly been made for them in the enclosed Statement No. 1 against Kodiyal bazaar, Kasba village, No. 18 in Magany No. 46 of Mangalore taluk.

5. For the increase to the pay of the Shanbogues and the allowances to the additional Potails, I propose to find funds by a further application of the plan described in paragraph 6 of my letter recorded with Board's Proceedings, dated 11th November 1882, No. 2745, viz., by refraining from appointing new Ugranies to 64 small or unimportant villages,* the number of Ugranies being thereby reduced from 1,011 to 947.

* Statement No. 3.

6. The enclosed statement of the village establishment is revised in accordance with the proposals now submitted for approval, and the following is the financial result :—

—	No.	Present Salary.	No.	Proposed Salary.
		RS.		RS.
Shanbogues	202	19,032	202	21,132
Potails	1,000	21,835	1,022	22,107
Ugranies	1,011	36,396	947	34,092
Total ...	2,213	77,263	2,171	77,331

	RS.	A.	P.	RS.	A.	P.
Village Service Cess at 6 pies per rupee ...	43,430	15	5			
Deduct surplus of certain Tarfs (groups of villages) which cannot be used for other Tarfs	72	5	2			
Balance ...	43,358	10	3			
Add Imperial Grant ...	33,974	11	3			
				77,333	5	6
Surplus ...				2	5	6

7. Though I have proposed for 28 villages only the permanent retention of more than one Potail with the newly sanctioned allowance, I feel that it is hard on men who have held a recognized position of importance in their villages to be suddenly deprived of it, though their conduct may have been in every way satisfactory, and I have therefore the honor to request permission to allow such additional Potails as may desire to do so to continue to hold the office, on existing conditions as regards emoluments, for life or during good behaviour, so long as the trifling amounts which they draw can be

met from savings, of which a considerable amount has already accumulated owing mainly to delay in connection with the appointment of new Ugranies.

Enclosures Nos. 1 to 3.—Statements.

Resolution—dated 27th May 1884, No. 1777.

Submitted for the orders of Government.

2. In G.O., Revenue Department, dated 19th October 1882, No. 1152, Government sanctioned a revised scale of village establishment for the South Canara district. The Collector now submits proposals for modifying it in certain particulars.

3. According to the sanctioned scheme, the pay of the Shanbogues (Curnams) varies from Rs. 6 to Rs. 10. It is now proposed to raise the minimum pay to Rs. 8 as is the case in North Canara, and to increase to Rs. 9 the salaries of those who were getting about Rs. 8 before the revision and of those who have charge of unhealthy villages under the ghâts. In the sanctioned scheme, the number of Potails (village headmen) was reduced in those cases in which there were two or more to a village, and remained unchanged in others. It is now suggested that a second Potail be employed in 28 important villages which had more than one Potail previous to the revision, to divide six villages which formed two Potails' charges into four as shown in the margin, and to omit eight of these servants in certain villages which have been under the charge of the Potails of other villages. It is considered difficult to secure punctuality of collections without increasing the number of Potails as stated above. Five additional Ugranies for the Mangalore town and two Ugranies for the villages noted in the margin are also provided chiefly for work connected with supplies. It is stated that the taluk peons who used to do the supply work in Mangalore town cannot be spared for this duty without detriment to their legitimate work. The additional charge on account of these modifications is proposed to be met by refraining from appointing new Ugranies to 71 unimportant villages as originally sanctioned.

Mangalore Taluk.		Number of Potails proposed.
Magany 29	Someshwar ...	1
	Uchila	1
Udipi Taluk.		
Magany 13	Kasba Karkala ... } Pervaje ... ... }	1
	Tellaru ... ... } Durga	1

Uppinangadi Taluk.		Sanctioned Number of Ugranies.	Proposed Number of Ugranies.
Magany 1	Kanniyur	...	1
Udipi Taluk.			
Magany 13	Kasba Karkala. } Pervaje ... }	2	2
	Tellaru ... } Durga ... }		1

4. The Board approve of the above proposals, which raise the total charge by only Rs. 68, and recommend them for the sanction of Government.

5. Besides those noticed above, the Collector proposes also the following temporary deviations from the sactioned scheme :—

(1) That the present incumbents of the three Ugranyships specified in paragraph 3 of the letter be allowed to draw the special rates which have hitherto been paid to them, and which slightly exceed the pay of Rs. 3 given to other Ugranies.

(2) That of the old Potails not provided for in the new scheme, those who wish to retain their posts be allowed to do so during their good behaviour, on their present small allowances.

6. The Collector thinks it hard that the village servants should suffer by the revision of establishment, and proposes to meet the temporary charge from savings which have accumulated owing to delay in the appointment of new Ugranies. As no such concession was considered necessary in other districts the establishments of which have been revised, the Board are not in favor of these proposals, and think

that the accumulated savings, which amounted to Rs. 36,444 at the end of March 1884, may be utilized in the construction of village chavadies as directed in G.O., dated 28th November 1879, No. 2212.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department, with three original statements to be returned.
,, the Collector of South Canara.

Order—dated 21st June 1884, No. 777, Revenue.

Miscellaneous.

The Government approve the Board's recommendations in their entirety and sanction their immediate adoption.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue, with three original statements.
,, the Accountant-General.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

79 Copies.

87

No. 2196/128

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre } (By order)
Madras 7th July 1884 }

[signature]
1st. Assistant

To,

The Dy Director of revenue Settlement
No. III party

Ju No 1974

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 21st June 1884, No. 777.

JUNE.

Village Establishment

in South Canara District.—The Board's recommendations regarding —, approved; and their immediate adoption, sanctioned.

24TH JUNE 1884, No. 787, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from J. H. GARSTIN, Esq., C.S.I., Acting 2nd Member of the Board of Revenue, to the Secretary to Government, Revenue Department, dated Madras, 3rd April 1884 :—

In reply to paragraph 7 of G.O., of March 18th, 1884, No. 396 (Revenue), I have the honor to state that it was not my intention to reduce the establishment of peons allotted either to tahsildars or deputy tahsildars but, on the contrary, to strengthen them by relieving the peons who are now told off for jail warders' duty in sub-jails of that duty and letting them revert to their own.

In paragraph 24 of my first report I said : "I propose that the jail department should supply its own sub-jail warder at every tahsildar's and deputy tahsildar's station where there is a sub-jail, thus setting free one taluk peon at every sub-jail." And in paragraph 54 I said : "I have already recommended that all peons doing jail warder's work should be relieved by the jail department."

2. I observe that, in paragraph 20 of the Government order under reply, the Government say they "do not approve the suggestion that hereditary right to village offices should be abolished." I would respectfully point out that I made no such suggestion. In paragraph 10 of my report I suggested the advisability of amending Regulation VI, 1831, so as to abolish the right to *sue* for the succession to village offices. I fear, however, I expressed myself badly. My intention was that the Government should so modify the regulation as to vest in Collectors the right of nomination and appointment absolutely to such offices without any appeal to the Revenue Board, but subject to the considerations—

(1) that the nominee is a resident of the village ;
(2) that he is a member of the mirasi family ;
(3) that he is fit to hold the office by reason of ability to read and write and keep accounts ; and
(4) that, in the absence of any such duly qualified member of the mirasi family, the Collector should be able to appoint any other qualified resident of the village to the office.

Against decisions of divisional officers in such cases appeals might still lie to the Collector, but no further. The words I used were : "I do not propose that any hereditary succession to such offices should be utterly ignored, or legally destroyed ; but what is, in my opinion, necessary is that the nomination and appointment of persons to all village offices should vest absolutely in the Collector, and that he should, in filling up a vacancy, look among the members of the family which has for many years held the office (the mirasi family in fact) for a person who is, in his opinion, well fitted to discharge the duties of the office, and, having found one, that he should then be at liberty to appoint him to the office provided he is a resident of the village in which he is to hold office ; but it should be further distinctly laid down that if the Collector cannot find any person among the members of the mirasi family who, in his opinion, is so qualified, that he should be at liberty to appoint any other resident of the village whom he may consider competent to discharge the duties of the office, even though he may be in no way connected with the mirasi family." (Section 10).

3. The Government then go on to say : "The Regulation now enables Collectors to exclude incapables and to insist on any educational or other qualifications for office which are deemed indispensable. It will suffice to instruct Collectors to exclude women and illiterate persons and to insist rigidly on residence of officers in the villages

to which they are appointed." I trust I may be excused for stating that I have been unable to find any provision in the regulation of the kind alluded to by Government, while, in G.O., of June 6th, 1883, No. 1507, Judicial Department, the Government have affirmed that Regulation IV of 1816 distinctly contemplates the appointment of *illiterate* men to such offices. It would, moreover, be impossible to bar the legal claim even of a woman to succeed to a village office by an executive order of Government.

4. Again, Collectors have no power to enforce their decisions in suits under Regulation VI of 1831 and to put the decree-holders into possession of the emoluments attaching to their offices. This is a great blemish and involves a practical denial of justice which calls loudly for remedy. I would, therefore, respectfully solicit reconsideration by the Government of their decision on this point. Perhaps, when replying to section 31 of the Government order, the Board of Revenue might be asked to state their views on this matter also.

5. Lastly, with reference to paragraph 25 of the Government order approving the credit of search and copying fees to Provincial Funds, I have the honor to point out that I only recommended that search-fees should be so credited. Moreover, copyists' fees have now to be credited to "Stamp Revenue" under the sub-head "Court Fees Stamps" under the orders of the Comptroller-General (*vide* his letters of 15th September 1883, No. 1471, and 21st January 1884, No. 2313, to the address of the Accountant-General, Madras, printed in * Board's Proceedings of 18th March 1884, No. 969).

* Copy herewith sent.

Order—dated 24th June 1884, No. 787, Revenue.

Miscellaneous.

The Government regret that they misunderstood Mr. Garstin's proposal in regard to hereditary right to village offices. There would seem, however, to be no great difference between the abolition of a right and the denial of the power to enforce it by suit. The provision in the regulation to which the Government referred as enabling Collectors to exclude incapables, is section 7, which empowers Collectors to remove village officers for incapacity. This implies that incapables should not be appointed, and women and illiterate persons may, in the opinion of Government, be justly deemed incapable of performing the duties.

2. The matter, however, is unquestionably one which admits of some doubt, and the Government think it very desirable, therefore, to provide by law that no person shall be recognised by Government as head of a village who is unable to read and write, or who is otherwise incapacitated from discharging his duties as such head; provided that any other resident ryot is available, who is not so incapacitated and who is willing to undertake the office.

3. The Board of Revenue will be requested to make provision in accordance with these views in the draft amending Act, the preparation of which was directed in G.O., 31st March 1884, No. 453.

(True Extract).

(Signed) H. E. STOKES,
Secretary to Government.

To J. H. Garstin, Esq., c.s.i., Acting 2nd Member of the Board of Revenue.
" the Board of Revenue.
" the Judicial Department.
" the Director of Revenue Settlement and Agriculture.

Exd. E. Fernandez.

70 Copies.

89

No. 2237

Communicated to the officers in charge of Settlement Parties and to the Agricultural reporter to Government, in continuation of this office No 1119 dated 8th April 1884.

Deptt of Rev Sett: and Agriculture, Madras, 9th July 1884 }

(By order)

Shaparah
1st Assistant

To. The Dy Director of Revenue Settlement No III party

Gobt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 24th June 1884, No. 787.

JUNE.

Hereditary Right to Village Offices

Board of Revenue requested to make provision in accordance with the views of Government on Mr. Garstin's proposal regarding — in the draft amending Act which is under preparation.

Revenue Department.

Proceedings of the Madras Government

Read the following: 90

Circular No. 698.

Extract from the Proceedings of the Government of India in the Revenue and Agricultural Department (Surveys), dated Simla, 18th June 1884.

Read—

The General Report on the Operations of the Survey of India during the year 1882-83, submitted with the letter from the Surveyor-General of India, No. 877-S. of the 14th April 1884.

RESOLUTION.

THE first chapter of the Report deals with the triangulation work of the year. The secondary triangulation which remained to be done, as stated in last year's Report, was taken up. One field party was employed in fixing points for the Marine Surveys. A series of secondary triangles, 97 miles in length, was executed along the east coast from the vicinity of Ichápur in the Ganjam District to the town of Pooree, which is well known as the seat of Jagannath's temple. Six beacons were erected and 115 conspicuous objects permanently fixed.

A second party took up the chain of secondary triangles required to furnish a basis for the geography of Upper Burma. Dense haze and forest fires obstructed the view of Sub-Surveyor Moung Shoay Gyoke in taking observations; but notwithstanding this, satisfactory progress was made, and the data gained will prove useful for future operations. The Government of India is glad to notice that the important work of visiting and covering in the stations of the series was carried out. The very important secondary series for the purpose of joining Singapore with India remains to be undertaken.

2. The second chapter deals with topography. Thirteen topographical parties continued their operations on the lines of previous years, except that the Rajputana party was transferred to Burma for forest survey work, and the work left unfinished in Rajputana was made over to the Gwalior and Central India party. The Bhopal and Malwa party was transferred to Mirzapur, and the survey of Malwa assigned to the Khandesh party. Including these changes the parties were thus distributed:—One in Central India and Rajputana, four in the Bombay Presidency, two in the North-Western Provinces, and the remaining six in Assam, Burma, Mysore, Kohat, Baluchistan, and on the Hooghly River.

3. The Rajputana and Central India party worked in two separate divisions —one in Gwalior and the other in the country south-west of Erinpura as well as in the desert west of Bickaneer. A total area of 846 square miles on the scale of 1″ = 1 mile, and of 5,534 square miles on the ½-inch scale was completely surveyed by the entire party.

A re-survey of the city and environs of Jeypore, required on account of alterations and additions to buildings and sites caused by the construction of the Rajputana Railway, was undertaken; but the work was unavoidably stopped and put off for the next season's operations, when the revision of the Ajmere city map will also be resumed.

4. Of the four parties employed in Bombay, the Khandesh party succeeded in completing the survey of that district, including certain outlying villages in the territory of His Highness the Nizam. This party then resumed the survey of Malwa and triangulated 600 square miles of ground in advance of topography.

5. The work of the Guzerat party was described in the remarks on the Report for 1881-82. This year the survey of the Dang Forests was completed, as well as the remaining portion of British territory which had to be surveyed on the 2-inch scale. The total area surveyed during the season was 1,331·7 square miles.

6. The Cutch party continued its work of previous years. The area of this year's operations includes the towns of Mundra, Naliy[illegible], Jakhawu, Tera, Kothara, and Suthri, besides two places of pilgrimage—Mata[illegible]omadh (Mhur), noted for manufacture of alum, and Narayan Sarovar. In [illegible]ll 1,632 square miles was topographically surveyed and a considerable area was [illegible]aversed and triangulated in advance.

7. The Deccan party continued the survey of the Souther[illegible] [illegible]lectorates, and completed a total area of 1,800 square miles, of which 1,509 [illegible]uare miles are in the districts of Sholapur, Satara, and Ratnagiri, and the re[illegible]aining areas in the dependent States of Anudh, Akalkot, Miraj Senior, and Jamkhandi. The survey of the municipal town of Pandharpur was carried on [illegible]uring the season. The town is an important pilgrim centre, and the work was somewhat impeded by the large crowds attracted to the many fairs which are held there.

8. The work assigned to the Mirzapur survey party (late Bhopal-Malwa party) was as follows:—

(1) the 2-inch survey of parganas Agori, Singrauli, and Dudhi, lying south of the Kaimur range and the river Sone;

(2) several hilly and forest tracts, partly on the 2-inch and partly on a 16-inch scale, which were left unsurveyed by the Revenue Survey party which was lately employed on the cadastral survey of the northern part of the district.

A small portion of the party which had been left behind in Bhopal completed the Bhopal and Malwa survey in the Central India Agency, and has now joined the head-quarters of the party at Mirzapur.

9. The second North-Western Provinces party was employed chiefly in the Bulandshahr and Aligarh Districts on the survey of the Dooab between the Ganges and Jumna. The civil station and city of Aligarh was also surveyed. It is satisfactory to notice the measures taken for the preservation of traverse stations as suggested by the Government of India in its Circular Resolution No. 45-S., dated the 4th September 1882. The continuance of Topographical parties in districts where the Settlement Department has already provided tolerably serviceable maps, is, however, of doubtful expediency, and the Topographical work of the North-Western Provinces party will probably be suspended pending the examination of the maps provided by recent settlement operations in the remaining districts on the list of tracts requiring Topographical Survey in the North-Western Provinces.

10. The Assam topographical party completed its work in South Sylhet, together with a large scale survey of Shillong. This party has been divided, one portion of it having undertaken a survey of the Andaman Islands, whilst the second half will be employed in surveying the head of the Dehing valley and the unexplored portion of the Patkoi range. This portion of the party also undertook a survey of the country inhabited by the Akas, the hill tribe which recently committed a raid on British territory.

11. A special topographical survey party was organized for British Burma at the Chief Commissioner's request to perform the following descriptions of work:—

(*a*) the survey of all lands remaining to be cadastrally surveyed,

(*b*) the survey of all hilly tracts,

(*c*) the survey of reserved forests.

Great difficulties were experienced in the season's operations from the hilly nature of the ground and the dense forests and the extreme unhealthiness of the country. The party was prostrated by fever, and the native establishment suffered greatly from dysentery and other malarious diseases.

The surveys were commenced on the usual topographical scale of 4″ = 1 mile, full details being shown as has hitherto been done in the case of other forest surveys; but with a view to expediting the completion of the work, and in order to lessen its cost, the Chief Commissioner has decided on adopting a modified 4-inch scale of survey, in which only the more important details will be given.

In addition to the forest surveys, it is proposed, if possible, to commence the mapping of the country between the Irrawaddy and Mimakha rivers.

12. The Mysore topographical party continued its work in that province and completed a total area of 4,644 square miles. Next season the town of Mysore and the town and cantonments of Bangalore will be surveyed in addition to the regular work of the party.

13. The Kohat party completed the survey of the district together with a large scale survey of the city and cantonment of Kohat.

14. *The Baluchistan survey.*—The principal work of this party was triangulation which was commenced at the Great Indus series and extended over the Suleman range through the Khetran country to the Marri hills. The topography of the year was carried on in the hilly country east of Kalat, also at the foot of the hills and in low country north of Sibi. The extremes of heat and cold between the autumn and winter months render it impossible for the party to work in any one locality throughout the field season.

15. The Hooghly river survey from Saugor Island to Baranagar near Barrackpore was completed, the map having been supplemented by soundings and river survey details measured by the Marine Survey Department.

16. *Mauzawar or village surveys.*—One party was employed in the Hissar district in the Punjab and made very good progress, having completely surveyed an area of 1,500 square miles, besides a good deal of traversing and the marking of traverse stations.

This survey, which was originally intended to be purely topographical, is now being carried on on the usual topographical scale of 2″ = 1 mile; but it assumes the nature of a mauzawar survey, inasmuch as it shows village boundaries and includes the determination of village areas. It also includes the determination of fixed points within the village areas, which will serve as the basis of a field survey when this is required for settlement purposes. It is anticipated that with the help of these points the village patwaris will be able to undertake the field survey on a scientific basis. The experiment is one in which the Government of India takes great interest, as it may lead to an important reform in the system of settlement surveys.

17. A second party was employed in Bombay, and completed the survey of 663 square miles in the Tanna district, besides a small area in the Jawar State.

18. The cost at which the work of each topographical party has been performed per square mile is not clearly shown. On this point supplementary information is desired. In future reports the expenditure incurred by the several parties should be included in the report, and in any case in which the cost exceeds a fair average rate an explanation should be given.

19. *Cadastral or field surveys* were carried on by two parties in the North-Western Provinces and by three in British Burma. One party in the North-Western Provinces completed the cadastral survey of the Ballia district together with a *mauzawar* survey of certain villages in the Shahabad and Sarun districts of Bengal. Operations were also commenced in Benares. A system new in form but the result of prolonged experiment and experience has been adopted in this district, which admits of the settlement establishment and the survey staff working in co-operation. The *khasras*, or village field books, are written up at the time of survey, and the *jamabandi* (or rent roll) slips compiled at recess quarters. The system is fully described in a joint memorandum by Mr. F. W. Porter (Settlement Officer) and Major W. Barron (Deputy Superintendent of Survey), and is appended to the report. The second cadastral party in the North-Western Provinces completed the field survey of Mirzapur and then commenced work in Gorakhpur.

20. In British Burma one party was employed in the Hanthawaddy district and cadastrally surveyed the Hmawbee township.

The other two parties were employed respectively in the Bassein-Henzada and in the Tharrawaddy-Prome districts.

All the cadastral surveys which were required in the Hanthawaddy and Tharrawaddy districts have now been completed, but large tracts in both districts remain to be topographically surveyed.

21. The surveys in Darjeeling were carried on in three different localities:—

(a) the revisionary survey of the district west of the Teesta and (b) the survey of Sikkim (both of which were completed);

(c) the Nepal boundary survey from the Kosi to the Gandak.

The whole boundary line requires restoration, and the work has been sanctioned by the Government of India.

22. Chapter XXIV (Geographical) contains a useful and interesting summary of the additions made during the course of the year to our geographical knowledge of the frontier. Reconnaisances were made beyond the British border into Afghanistan, which resulted in the completion of the frontier surveys up to the Gumal valley. A survey of the Jowaki hills was also completed by Munshi Esuf Sharif, to whom, as well as to Major Holdich and Messrs. Claudius and McNair, great credit is due for energy, courage, and professional skill.

A map of A—— K——'s geographical discoveries in Mongolia and Great Thibet is attached to the report and a full account of his explorations is reported to be under preparation. The Government of India awaits with interest the submission of this report, which promises to add largely to the existing geographical knowledge of those countries, and to throw light on the problems connected with the sources of the great rivers of the Burma peninsula. It may be noticed that the 1st class medal of the Geographical Society of Italy, which was placed at the disposal of the Surveyor-General for presentation to the most meritorious explorer, has been awarded to A—— K——.

23. Among the purely scientific work of the Department, Major Baird's report on the tidal disturbances caused by the volcanic eruption at Java in August last is a valuable record of the effect of this memorable convulsion on the oceanic tides, as observed on the Indian coast. Tidal observations were also conducted, as usual, during the year at the various tide registering stations under Major Baird's supervision, and the analysis of the results has been much aided by the advice and suggestions of Professors Darwin and Adams.

24. The spirit-levelling operations were carried on and completed on several branch lines from Diamond Harbour to Chinsurah; the line of spirit levels between the sea levels at Kurrachee and False Point was also completed.

25. The second part of the report deals with the operations of the Head-Quarters Offices of the Department. The Photographic and Lithographic Branches turned out a very satisfactory amount of work, and the results reflect considerable credit on Major Waterhouse and other officials connected with this section of the Department. In the Mathematical Instrument Department, 8,346 instruments were manufactured, being 661 less than the number manufactured in the preceding year, but the number of instruments repaired during the year was 25 per cent. greater than in 1881-82.

Very good progress was made in the Drawing Office. New maps of the North-Western Provinces and of the Punjab and a map of the Nizam's dominions are in course of completion; a complete series of provincial index maps are being prepared, and 5,195 cadastral maps were published. Three maps of India were also specially made for the Calcutta Exhibition.

26. The following is a comparative statement of the cost of cadastral surveys during the past three years:—

	Average cost per square mile.		
	1880-81.	1881-82.	1882-83.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
In the North-Western Provinces ...	159 4 11	138 13 3	150 5 1
In British Burma	250 8 7	232 4 9	266 14 11

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It would thus appear that the cost of cadastral surveys in both Provinces is greater than it was in the preceding year, while in Burma it is even higher than it was in 1880-81. It is extremely desirable that every effort should be made to keep down the cost of these surveys, in order that they may compare as favourably in point of expense with non-professional field surveys as they do in point of accuracy. At the same time the Government of India has great reason to be satisfied with the effect of the improvements introduced into the system in the North-West Provinces by Major Barron and other officers in connection with the cadastral surveys there in progress. And it is hoped that the experiment now being tried by the topographical party in Hissar may also lead to valuable results. The financial advantage of combining, as far as possible, topographical with revenue surveys, is manifest, and it would, for that reason, be undesirable, as has been urged elsewhere, to dissociate the Surveyor-General's Department too entirely from cadastral operations. It cannot be too strongly repeated that the willingness of Local Governments to employ cadastral parties supplied by the Survey Department on surveys for the cost of which the provincial revenues are to a great extent responsible, depends in no small degree on the extent to which the Survey Department is prepared to meet their financial requirements even at some sacrifice of scientific completeness and accuracy. As the Survey Department is maintained at a considerable cost to the Imperial Government, the Government of India, though not desiring to interfere with provincial arrangements in this respect, is anxious that the Department should be as extensively employed as is possible in executing the land revenue surveys of the country, and it trusts that this object may be found capable of attainment.

ORDER.—Ordered that copies of the Resolution be forwarded to the Surveyor-General of India, to the Local Governments and Administrations noted in the margin, and to the Foreign and Military Departments.

Madras.
Bombay.
Bengal.
North-Western Provinces and Oudh.
Punjab.
Central Provinces.
British Burma.
Assam.
Coorg.

(True extract.)

E. C. BUCK,
Secretary to the Government of India.

Order thereon 3d July 1884 No 2858

Communicated to the Board of Revenue, Director of Revenue Settlement and Agriculture and the Superintendent of Revenue Survey.

(True Extract)

(Signed) H E Stokes
Secretary to Government

To
The Board of Revenue
" Director of Revenue Settlement and Agr.
" Superintendent of Revenue Survey

1884.

GOVERNMENT OF INDIA.

REVENUE AND AGRICULTURAL DEPARTMENT.

SURVEYS.

No. 2347/134

Communicated to the officers in charge of Settlement parties.

(By order)

[signature]

1st Assistant

Deptt. of Rev. Settt. and Agriculture, Madras, 18th July 1884

To,

The Dy Director No III party

RESOLUTION.

Circular No. 69S.

Dated Simla, the 18th June 1884.

SUBJECT.

Reviews the General Report on the operations of the Survey of India Department during the year 1882-83.

G. C. B. Press, Simla.—No. 195 R. & A. D.—19-6-84.—1,350.

Revenue Department
Proceedings of the Madras Government
Read the following:—

Progs No 58 [illegible]

29TH APRIL 1884, No. 427 I., PUBLIC WORK

93

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

Proceedings of the Government of India, Public Works Department (Account—Irrigation), dated Fort William, 14th March 1884, No. 57 A.I.

Orders on the Budget Estimate of the Irrigation Branch, Madras, for 1884 85.

Read—the following papers :—

Resolution by the Government of India, Public Works Department, No. 121 A.I., dated 8th November 1883.

Letter from the Government of Madras, Public Works Department, No. 18 I., dated 7th January 1884.

Ditto	ditto	ditto,	ditto,	No. 34 I., dated 16th January 1884.
Telegram	ditto	ditto,	ditto,	dated 2[illegible] January 1884.
Ditto	ditto	India,	ditto,	No. 4 A.I., dated 24th January 1884.
Letter	ditto	ditto,	ditto,	No. 15 A.I., dated 25th January 1884.
Telegram	ditto	Madras,	ditto,	dated 29th January 1884.
Ditto	ditto	India,	ditto,	No. 8 A.I., dated 31st January 1884.
Letter	ditto,	ditto,	ditto,	No. 19 A.I., dated 1st February 1884.
Ditto	ditto	ditto,	ditto,	No. 20 A.I., dated 1st February 1884.
Ditto	ditto	ditto,	ditto,	No. 22 A.I., dated 1st February 1884.
Telegram,	ditto	Madras,	ditto,	dated 2nd February 1884.
Ditto	ditto	India,	ditto,	No. 12 A.I., dated 5th February 1884.
Letter	ditto	Madras,	ditto,	No. 134 I., dated 7th February 1884.
Ditto	ditto	ditto,	ditto,	No. 149 I., dated 8th February 1884.
Ditto	ditto	ditto,	ditto,	No. 173 I., dated 12th February 1884.
Ditto	ditto	India,	ditto,	No. 40 A.I., dated 22nd February 1884.
Telegram	ditto	Madras,	ditto,	dated 27th February 1884.
Ditto	ditto	ditto,	ditto,	dated 28th February 1884.
Ditto	ditto	India,	ditto,	No. 37 A.I., dated 29th February 1884.
Ditto	ditto	Madras,	ditto,	dated 1st March 1884.
Ditto	ditto	ditto,	ditto,	No. 38 A.I., dated 1st March 1884.
Ditto	ditto	ditto,	ditto,	No. 39 A.I., dated 4th March 1884.

F—FAMINE RELIEF AND INSURANCE.

34—Protective Works—Irrigation.

Resolution.—The budget estimate for expenditure during 1884-85 has been prepared for Rs. 3,99,000, the amount provisionally sanctioned in Government of India, Public Works Department, Resolution, No. 121 A.I., dated 8th November 1883.

2. The following statement details the estimated charges for 1884-85, compared with the revised and budget estimates for 1883-84 and the actuals of 1882-83 :—

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
	RS.	RS.	RS.	RS.
Imperial.				
Irrigation and Navigation Works.				
Rushikulya project	2,49,000	89,81	84,000	3,343
Hindupur and Rodham project	...	...	...	3,964
Barur tank	...	—1,242	...	304
Bellary project	...	5,600	33,000	...
Pálár anicut channels	...	10,189	...	8,275
Suggalair project	...	...	...	[illegible]
Tungabhadra project	...	...	...	588
Marandahully project	...	...	...	81
Pugalar and Calingaroyan channels ..	...	12,311	...	3,191
Krishnagiri reservoir	...	[illegible]	15,000	11,478
Vaniar project	...	5,080	...	8,363
Lower Coleroon project	...	...	2,000	...
Bhaváni "	...	...	15,000	...
Periyar "	...	...	...	5,391
Papanasam "	...	...	18,000	...
Buckingham "	1,50,000	1,33,000	...	1,581
Ganjam-Gopalpur tidal canal	...	10,000	33,000	13,509
Subsequent modification, details not communicated	...	—15,981	...	...
Total ...	3,99,000	1,79,191	2,00,000	64,253

3. The revised estimate for 1883-84 compared with the budget estimate for that year shows a lapse of Rs. 20,809 as detailed below. The amount withdrawn by the Government of India was from the grants sanctioned for the Rushikulya project and the investigation of projects generally, as the Government of Madras was not able to form the division for the prosecution of the former work, nor to keep the establishment in the project divisions up to the sanctioned scale; a write-back was also made of the outlay incurred on the Barur tank in 1881-82 and 1882-83 from this head to the head "N—Expenditure on Productive Public Works—Capital Account, 51—Irrigation and Navigation" :—

	RS.	RS.
Additional grant sanctioned for the Buckingham canal (a work classed as H—44—Provincial)		1,33,000
Deduct—Amount withdrawn in Government of India, Public Works Department, letters, Nos. 22 and 40 A.I., dated 1st and 22nd February 1884, respectively	1,36,586	
Outlay incurred on the Barur tank in 1881-82 and 1882-83 written back to N—Expenditure on Productive Public Works—Capital Account—51—Irrigation and Navigation ...	1,242	
Surrender intimated by the Government of Madras in telegram, dated 27th February 1884, of which no details were furnished ...	15,981	
		1,53,809
Difference ...		—20,809

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G—REVENUE FROM, AND EXPENDITURE ON, PRODUCTIVE PUBLIC WORKS (REVENUE ACCOUNT).

XXVII—IRRIGATION AND NAVIGATION—DIRECT RECEIPTS.

4. The following statement details the revenue estimated to be derived in 1884-85 compared with the revised and budget estimates for 1883-84 and actuals of 1882-83 :—

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
IMPERIAL.	RS.	RS.	RS.	RS.
Irrigation and Navigation Works.				
Godávari delta system	79,000	82,500	91,050	76,747
Kistna ,, ,, ...	50,200	49,800	36,580	49,727
Pennér anicut ,, ...	200	260	400	157
Cauvery delta ,, ...	8,000	8,000	9,100	8,393
Srivaikuntham anicut system	2,000	2,000	1,100	1,854
Kurnool canal	10,000	5,000	5,000	76,023
Total ...	1,49,400	1,47,560	1,43,230	2,12,901

5. The revised estimate for 1883-84 compared with the budget estimate for that year shows an increase of Rs. 4,330 ; this is due chiefly to the increased receipts from navigation on the Kistna delta system.

6. The budget estimate for 1884-85 compared with the revised estimate for 1883-84 shows an increase of Rs. 1,840 ; this is due chiefly to the increased revenue anticipated from the Kistna delta system and the Kurnool-Cuddapah canal.

XXVIII—PORTION OF LAND REVENUE DUE TO IRRIGATION.

7. The following statement details the revenue estimated to be credited in 1884-85 compared with the revised and budget estimates for 1883-84 and the actuals of 1882-83 :—

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
IMPERIAL.	RS.	RS.	RS.	RS.
Godávari delta system	15,21,920	15,21,920	16,25,856	14,68,451
Kistna ,, ,, ...	8,85,312	8,85,312	9,54,912	8,17,606
Pennér anicut ,, ...	1,16,000	1,16,000	1,22,960	1,20,470
Cauvery delta ,, ...	6,45,888	6,45,888	8,52,832	6,47,874
Srivaikuntham anicut system ...	87,232	87,232	69,136	89,410
Kurnool canal	64,960	52,896	78,880	...
Total ...	(a) 33,21,312	(a) 33,09,248	(a) 37,04,576	(a) 31,43,811

(a)—Excludes collection charges in the Civil Department.

8. The revised estimate for 1883-84 compared with the budget estimate for that year shows a falling off of Rs. 3,95,328. The revised estimate is based on the actuals of the past year and on the average receipts of the past three years. The budget estimate of 1883-84 appears to have been placed at too high a figure.

9. The budget estimate for 1884-85 compared with the revised estimate for 1883-84 shows a small increase of Rs. 12,064 ; this occurs on the Kurnool-Cuddapah canal, and is due to the closing of the breaches in the Soonkesala anicut and the Tangadancherla tank.

38—Irrigation and Navigation.

10. For expenditure the budget estimate for 1884-85 was prepared for Rs. 9,07,000, the amount provisionally sanctioned in Government of India, Public Works Department, Resolution, No. 121 A.I., dated 8th November 1883; but subsequently an additional sum of Rs. 13,590 was sanctioned in Government of India, Public Works Department, letter, No. 40 A.I., dated 22nd February 1884, which raised the grant for 1884-85 to Rs. 9,20,590.

11. The following statement details the estimated charges for 1884-85 and compares them with the revised and budget estimates for 1883-84 and the actuals of 1882-83:—

——	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
	RS.	RS.	RS.	RS.
Imperial.				
Irrigation and Navigation Works.				
Godávari delta system	3,64,937	3,69,570	2,85,621	3,15,838
Kistna „ „	2,91,160	2,83,992	2,38,220	2,72,168
Pennér anicut „	14,275	23,050	31,140	16,334
Cauvery delta „	9,919	36,674	1,28,034	29,217
Srívaikuntham anicut system	19,997	8,637	22,798	17,143
Kurnool-Cuddapah canal	2,20,302	1,96,496	2,40,626	1,33,410
Additional allotment provisionally allowed to stand pending further consideration ...	...	...	2,63,161	...
Subsequent modifications intimated by telegram, of which details were not given ...	...	—16,010	...	...
Total ...	9,20,590	9,02,409	12,09,600	7,84,110

12. The revised estimate for 1883-84 compared with the budget estimate for that year shows a lapse of Rs. 3,07,191 as detailed below. This is due chiefly to certain items of expenditure (old maintenance charges) hitherto shown under this head having, under the orders of the Government of India, been transferred to the head H—44, and also to the fact that an excess grant for establishment was allowed to stand provisionally in the budget estimate, 1883-84, pending further consideration:—

	RS.	RS.
Additional grants sanctioned during the year—		
Cauvery delta system	...	11,853
Pennér anicut „	...	12,450
Percentage for establishment charges	...	17,245
Godávari delta system	13,500	
	7,656	
		21,156
		62,704
Deduct—Amounts withdrawn—		
Old maintenance charges and portion of establishment grant allowed to stand pending further consideration	3,29,294	
Surrender on account of net decrease in revenue ...	3,711	
Surrender of a portion of the grant for the Godávari delta system and Kurnool-Cuddapah canal ...	20,880	
Surrender intimated by telegram, of which no details have been furnished	16,010	
		3,69,895
Net lapse ...		3,07,191

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H—RECEIPTS FROM, AND EXPENDITURE ON, PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.

XXXI—IRRIGATION AND NAVIGATION.

13. The following statement details the revenue expected to be derived in 1884-85 compared with the revised and budget estimates for 1883-84, and the actuals of 1882-83 :—

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
IMPERIAL.	RS.	RS.	RS.	RS.
Irrigation and Navigation Works.				
Works for which Capital and Revenue Accounts are kept—				
Chembrambakum tank	50	100	100	85
Pálár anicut system	550	270	270	266
Pelandorai anicut system	50	50	50	...
	650	420	420	351
Works for which neither Capital nor Revenue Accounts are kept	12,000	12,000	15,000	12,146
Agricultural Works.				
Works for which neither Capital nor Revenue Accounts are kept	10,000	10,000	19,000	10,130
Total, Imperial ...	22,650	22,420	34,420	22,627
PROVINCIAL.				
Irrigation and Navigation Works.				
Works for which Capital and Revenue Accounts are kept—				
Madras water-supply and irrigation extension project	5,960	30,000	12,000	32,336
Buckingham canal	33,100	42,580	1,17,000	1,08,127
Total, Provincial...	39,060	72,580	1,29,000	1,40,463
Grand Total...	61,710	95,000	1,63,420	1,63,090

14. The revised estimate for 1883-84 compared with the budget estimate for that year shows a falling off of Rs. 68,420 ; made up as follows :—

	RS.
Imperial	12,000
Provincial	56,420
Total ...	68,420

The falling off under *Imperial* is due to the revised estimate having been based on the actuals of the previous year, while the falling off under *Provincial* is due to the reduction in the rates of tolls and license fees on boats plying on the Buckingham canal.

15. The budget estimate for 1884-85 compared with the revised estimate for 1883-84 shows a falling off of Rs. 33,290 ; made up as follows :—

	RS.
Imperial	+230
Provincial	—33,520
Net ...	—33,290

The increase under *Imperial* represents the net balance of a few minor increases and decreases on some of the works, while the apparent falling off under *Provincial* is

due to the fact that the amount to be recovered from the Madras municipality for the supply of water to the town of Madras is for one year only, whereas the amount provided in the revised estimate for 1883-84 is the aggregate of the arrears due for several years

44—IRRIGATION AND NAVIGATION.

16. The budget estimate for outlay in 1884-85 was prepared for the amount noted in the margin, but as provision was made therein to the extent of Rs. 68,000* for expenditure on the Pálár and Pelandorai anicut systems for which revised estimates have been needed for several years past, the Government of India, in Public Works Department letter, No. 22 A.I., dated 1st February 1884, decided to withhold this sum in reserve until revised estimates are submitted and sanctioned by competent authority; the provision for 1884-85 under Imperial was accordingly reduced to Rs. 23,77,000. Under Provincial, however, an additional sum of Rs. 1,40,000 was subsequently sanctioned, which raised the grant under this head to Rs. 3,50,500.

	RS.
Imperial (provisionally sanctioned in Government of India, Public Works Department, Resolution, No. 121 A.I., dated 8th November 1883)	24,45,000
Provincial	2,10,500
Total ...	26,55,500
* Pálár anicut system	37,100
Pelandorai "	30,900
Total ...	68,000

17. The following statement details the estimated charges for 1884-85 compared with the revised and budget estimates for 1883-84 and the actuals of 1882-83 :—

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
IMPERIAL.	RS.	RS.	RS.	RS.
Irrigation and Navigation Works.				
Works for which Capital and Revenue Accounts are kept—				
Capital—				
Chembrambakum tank ...	...	...	...	—311
Pálár anicut system ...	...	...	48,000	—1,39,830
Pelandorai anicut system ...	...	3,289	25,000	22,116
	...	3,289	73,000	—1,18,025
Revenue—				
Chembrambakum tank	—1,000	12,375	6,360	—2,835
Pálár anicut system	26,000	32,929	29,907	37,846
Pelandorai anicut system	11,000	30,275	11,233	46,543
	36,000	75,579	47,500	81,554
Total ...	36,000	78,868	1,20,500	—36,471
Works for which neither Capital nor Revenue Accounts are kept	19,41,000	17,86,952	13,17,460	15,67,318
Agricultural Works.				
Works for which neither Capital nor Revenue Accounts are kept	4,00,000	4,40,958	5,40,340	5,67,993
Subsequent modifications intimated by telegram, of which no details have been given	...	—18,377	...	...
Total, Imperial ..	23,77,000	(a)22,88,401	(b)19,78,300	(c) 20,98,840

(a)—Includes Rs. 15,000, (b) Rs. 18,000, and (c) Rs. 10,568 on account of expenditure in England.

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
	RS.	RS.	RS.	RS.
PROVINCIAL.				
Irrigation and Navigation.				
Capital—				
Buckingham canal	2,20,000	1,47,000	1,96,500	1,57,455
Madras water-supply project ...	23,555	38,000	38,000	17,705
	2,43,555	1,85,000	2,34,500	1,75,160
Revenue—				
Buckingham canal	95,000	1,63,200	1,03,500	1,61,555
Madras water-supply project ...	11,945	13,800	12,000	16,387
	1,06,945	1,77,000	1,15,500	1,77,942
Subsequent modifications intimated by telegram, of which no details have been given	...	+4,920	...	...
Total, Provincial ...	3,50,500	3,60,893	3,50,000	3,53,102
Grand Total ...	27,27,500	(*a*) 26,49,294	(*b*) 23,28,300	(*c*) 24,51,942

(*a*)—Includes Rs. 15,000, (*b*) Rs. 18,000, and (*c*) Rs. 10,568, on account of expenditure in England.

18. The revised estimate for 1883-84 compared with the budget estimate for that year shows an increase of Rs. 3,20,994; made up as follows:—

	RS.
Imperial	3,10,101
Provincial	10,893
Total ...	3,20,994

The increase under *Imperial* is due to the following additional grants sanctioned during the year by the Government of India, Public Works Department, in the letters noted in the margin:—

No. 114 A.I., dated 7th November 1883.
„ 4 A.I., „ 11th January 1884.

	RS.
Old maintenance charges of productive public works	1,63,988
6 per cent. for establishment charges on the portion of indirect revenue due to old irrigation under productive public works ...	1,64,490
	3,28,478
Deduct—Amount surrendered by telegram, of which no details have been given	18,377
	3,10,101

The increase under *Provincial* is the amount of an additional grant sanctioned by the local Financial Department to meet expenditure in England for pumps and engines required for the Buckingham canal.

19. The following statement compares the estimated *direct Capital outlay* on the works in progress to the close of 1884-85 with the sanctioned estimates :—

—	Sanctioned Amount.	Probable Outlay to end of 1884-85.				Balance remaining to be spent.
		Actuals to end of 1882-83.	Revised Estimate, 1883-84.	Budget Estimate, 1884-85.	Total.	
	RS.	RS.	RS.	RS.	RS.	RS.
Imperial—						
Pálár anicut system	16,85,388	15,92,004	..	..	15,92,004	93,384
Pelandorai ,, ...	3,65,588	3,53,542	12,510	..	3,66,052	— **464**
Provincial—						
Buckingham canal	86,12,000	48,92,525	2,80,000	1,81,000	a53,53,525	32,58,475
Madras water-supply and irrigation extension project	15,69,239	14,72,958	38,000	23,555	15,34,513	34,726

a—Includes grant-in-aid from F. Famine—Relief and Insurance Funds.

20. Completion estimates for the Pálár and Pelandorai anicut systems have been frequently stated to be under the consideration of the Madras Government. Until the completion estimates, so long under consideration, are submitted and sanctioned by competent authority, no further expenditure on these two projects can be permitted; and, as stated in paragraph 16, the provision of Rs. 68,000 made for these works for 1884-85 under Capital has been withheld and placed in reserve until the necessary estimates are submitted and sanctioned by competent authority.

N—EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.

51—IRRIGATION AND NAVIGATION.

21. The budget estimate for expenditure on productive public works during 1884-85 has been prepared for Rs. 19,80,000, the amount provisionally sanctioned in Government of India, Public Works Department, Resolution, No. 121 A.I., dated 8th November 1883.

22. The following statement details the estimated charges for 1884-85 compared with the revised and budget estimate for 1883-84 and the actuals of 1882-83 :—

	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actuals, 1882-83.
	RS.	RS.	RS.	RS.
Godávari delta system	4,58,000	3,96,841	3,50,000	2,20,034
Kistna delta ,, ...	5,25,000	4,49,290	4,50,000	2,00,948
Sangam anicut ,, ...	6,08,000	5,49,970	4,64,000	5,25,847
Cauvery delta ,, ...	2,62,000	1,87,849	2,00,000	30,489
Srívaikuntham anicut system ...	41,500	54,240	36,000	13,628
Kurnool-Cuddapah canal	...	*1,28,000	*1,60,000	*1,76,25,819
Barur tank project	85,500	19,613	...	...
Subsequent modifications intimated by telegram, of which no details have been given	+ 4,000	—29,950	...	...
Total ...	(*a*)19,84,000	(*b*)17,55,353	16,60,000	1,86,16,765

* Purchase price of the canal paid in England.
(*a*)—Includes Rs. 4,000 and (*b*) Rs. 30,000 on account of expenditure in England.

23. The revised estimate for 1883-84 compared with the budget estimate for that year shows an increase of Rs. 95,353 made up of the following additional grants sanctioned during the year by the Government of India, Public Works Department, in the letters noted in the margin :—

No. 363 I., dated 16th October 1883.
Telegram, No. 70 C. W. I., dated 24th October 1883.
No. 124 A.I., dated 13th November 1883.
,, 15 ,, ,, 25th January 1884.
,, 16 ,, ,, 29th ,, ,,
,, 19 ,, ,, 1st February ,,
Telegram, No. 12 A.I., dated 5th February 1884.

	RS.	RS.
Barur Tank	...	19,613
Sangam Anicut System	30,919	
" " "	18,551	
" " "	36,500	
		85,970
Srívaikuntham Anicut System		20,377
Godávari Delta System		11,343
" " "		20,000
Total ...		1,57,303
Deduct—Reduction in estimated expenditure in England in 1883-84 on account of purchase of Kurnool-Cuddapah Canal	—32,000	
Increased expenditure in England on account of stores.	+ 15,000	17,000
Net increase ...		1,40,303
Deduct—Subsequent modification telegraphed by the Government of Madras, of which no details have been given ...		44,950
Balance ...		95,353

24. The following statement details the estimated *direct* capital outlay on the works in progress to end of 1884-85 compared with the sanctioned estimates :—

—	Sanctioned estimate.	PROBABLE OUTLAY TO END OF 1884-85.				Balance remaining to be spent.
		Actuals to end of 1882-83.	Revised Estimate, 1883-84.	Budget Estimate, 1884-85.	Total.	
	RS.	RS.	RS.	RS.	RS.	RS.
Godávari Delta System	1,10,88,695	92,39,974	3,96,341	4,58,000	1,00,94,315	9,94,380
Kistna Delta System	1,38,99,784	58,74,768	4,49,290	5,25,000	68,49,058	70,50,726
Sangam Anicut System	28,96,437	7,57,154	5,49,970	6,08,000	19,15,124	9,81,313
Cauvery Delta do.	16,80,217	10,47,663	1,87,849	2,62,000	14,97,512	1,82,705
Srívaikuntham Anicut System ..	13,61,520	12,38,078	54,240	41,500	13,33,818	27,702
Kurnool-Cuddapah Canal ..	1,77,53,819	1,76,25,819	1,28,000	..	1,77,53,819	..
Barur Tank Project	3,20,000	(a)	19,613	85,500	1,05,113	2,14,887

(a)—Excludes outlay incurred under H—46 not written back yet to N—54.

25. The following statement shows the financial results of the Irrigation and Navigation Works for which Capital and Revenue Accounts are kept to the close of 1884-85 :—

—	CAPITAL OUTLAY TO END OF 1884-85.			NET REVENUE, INCLUDING ENHANCED LAND REVENUE.				Charges for interest to end of 1884-85.	Net revenue in excess of interest to end of 1884-85.
	Direct.	Indirect.	Total.	Actuals to end of 1882-83.	Revised Estimate, 1883-84.	Budget Estimate, 1884-85.	Total to end of 1884-85.		
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Productive Public Works.									
Godávari Delta System	1,00,94,315	18,57,911	1,19,52,226	2,38,30,805	12,16,181	12,16,983	2,62,63,969	89,47,049	1,73,16,920
Kistna Delta System.	68,49,058	5,44,694	73,93,752	1,03,73,435	6,38,721	6,31,720	1,16,43,876	53,26,664	63,17,212
Pennér Anicut "	14,28,862	2,36,297	16,65,159	12,09,759	91,928	1,00,885	14,02,572	11,88,841	2,13,731
Sangam Anicut "	19,15,124	1,99,031	21,14,155	..	..	..	..	1,31,149	—1,31,149
Cauvery Delta "	14,97,512	1,55,231	16,52,743	1,40,28,384	6,12,691	6,40,141	1,52,81,216	12,60,541	1,40,20,675
Srívaikuntham Anicut System	13,33,818	1,15,491	14,49,309	3,47,082	79,779	68,121	4,94,982	6,95,649	—2,00,667
Kurnool-Cuddapah Canal	1,77,53,819	..	1,77,53,819	—63,708	-1,44,901	-1,51,534	—3,60,143	17,70,247	—21,30,390
Barur Tank Project.	1,05,113	11,794	1,16,907	..	..	..	..	2,886	—2,886
Total ..	4,09,77,621	31,20,449	4,40,98,070	4,97,25,757	24,94,399	25,06,316	5,47,26,472	1,93,23,026	3,54,03,446
Public Works not classed as Productive.									
Chembrambakum Tank	6,24,425	1,12,164	7,36,589	2,65,672	20,437	34,227	3,20,336	3,36,082	—15,746
Pelandorai Anicut System	3,66,052	40,191	4,06,243	—1,95,868	—24,420	—4,648	—2,24,936	1,28,239	—3,53,175
Pálár Anicut System.	15,92,004	2,42,282	18,34,286	5,81,755	73,660	81,053	7,36,468	14,98,531	—7,62,063
Total ..	25,82,481	3,94,637	29,77,118	6,51,559	69,677	1,10,632	8,31,868	29,62,852	—11,30,984

26. The authorizations herewith given are subject to the condition of a strict adherence to the rules in force in regard to financial regularity of departmental work.

Order—Ordered, that this Resolution be communicated to the Government of Madras, in the Public Works Department, for information and guidance, with the request that 35 printed copies of the final issues of the budget estimates, as now passed, may be submitted so as to reach this office not later than the 1st May 1884.

(Signed) W. S. TREVOR, Colonel, R.E.,
Secretary to the Government of India.

Telegram from the Secretary to Government, Public Works Department, to the Secretary to the Government of India, Public Works Department, Simla, dated Madras, 5th April 1884.

Your No. 57 A. I., 14th ultimo.

Para. 17. Revised estimate reduced by Rs. 30,377 in my telegram, 27th February, and increased by Rs. 15,000 in my telegram, 1st ultimo. Net reduction 15,377 not 18,377.

Paras. 22 and 23. Rs. 15,000 for increased expenditure in England for stores included in previous figures. Total revised estimate should be only 17,40,353 as shown in corrected copy sent with my No. 284 I., 12th ultimo. Can correct figures be adopted in final issue ?

Telegram from the Secretary to the Government of India, Public Works Department, to the Secretary to the Government of Madras, Public Works Department, dated Simla, 8th April 1884.

Your telegram fifth. Final issue revised estimate ; must adopt figures passed in orders.

No. 86 I.

Note by the Chief Engineer for Irrigation.

The accompanying budget estimates, final issue, for Productive Public Works and for Irrigation and Navigation and Agricultural and Protective Works for 1884-85, which has been prepared in conformity with the orders of the Government of India, No. 57 A.I., dated 14th March 1884, are submitted to Government with the following remarks.

2. The revised estimate of expenditure for 1883-84 and the budget estimate for 1884-85 under each head are as shown below :—

	Revised Estimate, 1883-84.	Budget Estimate, 1884-85.
Imperial.	RS.	RS.
N. Productive Public Works—Capital Account ...	17,55,353	19,84,000
G. Do. do. Revenue do. ...	9,02,409	9,20,590
H. Public Works not classed as Productive ...	22,88,401	23,77,000
F. Famine Relief and Insurance	1,79,191	3,99,000
Total ...	51,25,354	56,80,590
Provincial.		
H. Public Works not classed as Productive ...	3,60,893	3,50,500
Grand Total ...	54,86,247	60,31,090

IMPERIAL.

N. PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.

3. Some confusion has arisen under this head regarding the amount to be provided for "expenditure in England." In the preliminary issue of the budget as

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submitted by this Government, the provision for "expenditure in England" was as follows :—

	RS.
Balance of purchase-money of Kurnool-Cuddapah Canal	1,60,000
Stores	37,510
Total ...	1,97,510

In their first orders, dated 22nd February, on the preliminary issue, the Government of India reduced the provision for "expenditure in England" to Rs. 1,43,000, of which Rs. 1,28,000 was for the Kurnool-Cuddapah canal, and Rs. 15,000 for stores. The reduction of Rs. 32,000 in the provision for the Kurnool-Cuddapah canal was surrendered to the Government of India by telegram on February 28th, but the original provision for stores remained unaltered. The Government of India intimated by telegram on March 1st, that the provision for expenditure in England on account of stores should be increased from Rs. 15,000 to Rs. 30,000, and the balance then remaining of Rs. 7,510, was surrendered by telegram on March 1st. In spite, however, of full provision for the expenditure on stores having thus been made, the Government of India, in their final orders, dated 14th March, on the preliminary issue of the budget, included a further provision of Rs. 15,000, so that Rs. 45,000 in all are now available, as it was said to be impossible to correct the mistake in the figures, and to reduce the accepted total. It is now suggested that the surplus, Rs. 15,000, should be made available for the adjustment of the charge in connection with the Priestman's dredger purchased for the Godávari Delta. This charge is treated as final in the home accounts under the head "H. Expenditure on Public Works not classed as Productive," but this is wrong, and the charge should properly be under the head "N. Expenditure on Productive Public Works, Capital Account," as stated in paragraph 3 of note No. 43 I., dated 8th March, printed in Proceedings of Madras Government, No. 283 I., of March 12th. The adjustment in question has to be carried out in the Indian accounts.

4. The schedules showing the distribution, by component works, of the grant for 1884-85, under this head, received from the Superintending Engineers, have been revised in this office so as to work up to the sanctioned accounts.

G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.

5. The grant sanctioned for 1884-85, under this head, does not include any provision for expenditure on revenue account on the Sangam anicut system. The budget estimate of irrigation revenue does also not include the revenue expected to be derived from this system, as the probability of this system commencing to yield revenue during 1884-85 was not known when the preliminary issue of the budget estimates was prepared. The Superintending Engineer, II Circle, reports that the Main canal and Kanigiri tank will both be completed by September next, in time to receive the freshes of the north-east monsoon; also that the first six miles of the Eastern channel from the Kanigiri tank will be finished, and that the Alleru, Yelliapalem, and Duvur branch channel, and the Central channel from the Kanigiri tank will also be ready to receive a supply. He estimates the revenue to be derived at Rs. 16,000, allowing Rs. 5 per acre on the additional 3,200 acres which he expects to irrigate during the year according to the marginally noted calculation, and he applies for Rs. 16,000 for expenditure under Maintenance and Repairs. Including the share of establishment charges, the estimate of expenditure exceeds the estimate of revenue by Rs. 3,680. The Superintending Engineer should report the nature of the work to be carried out and whether the amount proposed is required for expenditure before water is, for the first time, let into the channels or

	Increased Area of Irrigation. ACS.
Duvur branch channel	200
Kanigiri tank.	
Eastern channel	500
Alleru branch channel	300
Yelliapalem channel	200
Central channel	2,000
Total ...	3,200

on repairs to be executed after the irrigation season is over. In the former case the expenditure should be treated as repairs during construction, and charged to capital account. It seems improbable that Rs. 16,000 will be required during the current official year for repairs after the close of the irrigation season, and the Superintending Engineer should report the amount absolutely necessary for repairs chargeable to the revenue account of the system. An application for an additional allotment may then be submitted to the Government of India if the amount required cannot be met by reappropriation. The opinion of the Collector regarding the estimate of irrigation revenue does not appear to have been obtained. The Director of Revenue Settlement and Agriculture may be requested to ascertain, in communication with the Collector, and report whether the Superintending Engineer's estimate may be accepted, and if so, to include the amount in his revised estimate of irrigation revenue for 1884-85.

H. Public Works not classed as Productive.

6. The Government of India reduced the total revised estimate for 1883-84, under this head, by Rs. 3,000, and this amount has been deducted as marginally noted, the Superintending Engineer, VI Circle, having reported a large surrender from the grant for the Támbraparni flood embankments, which was not accepted, as his report had been received after the close of the official year.

Agricultural Works. River embankments.	RS.
Támbraparni river left bank from the Srivaikuntham anicut to $7\frac{1}{2}$ miles ...	2,410
Establishment at 23 per cent. ...	554
Tools and plant at $1\frac{1}{2}$ per cent. ...	36
Total ...	3,000

7. The grants for minor original works under "Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept" in the Ganjam and North Arcot divisions have been increased from Rs. 5,000 to 10,000, and from Rs. 6,000 to 12,000, respectively, the Superintending Engineers concerned having reported that the original allotments were insufficient. The amount provided for reserve at the disposal of Government is consequently reduced by Rs. 11,000.

F. Famine Relief and Insurance.

8. The Superintending Engineer, I Circle, should expedite the submission of the schedule of expenditure for the Rushikulya project showing his proposed distribution of the grant for the current year. No time should be lost in putting the works in hand so as to fully utilize the whole of the grant.

PROVINCIAL.

H. Public Works not Classed as Productive.

9. The Superintending Engineer, V Circle, has been requested to submit a revised schedule of expenditure on the works proposed to be executed on the Buckingham canal during the current year, in accordance with the arrangements sanctioned in G.O., No. 814 W., dated 25th March 1884. These provided for the carrying out of the completion works on the canal thoroughly and continuously, proceeding southwards from Pedda Ganjam in the Kistna district.

Order—dated 29th April 1884, No. 427 I., Public Works.

The budget estimates, final issue, for Irrigation Productive Public Works and for Irrigation and Navigation, Agricultural and Protective Works, for 1884-85, as drawn up by the Chief Engineer for Irrigation are approved, and a copy thereof, together with a copy of these proceedings in manuscript, will be forwarded to the Government of India. The remaining copies required by the Government of India will be forwarded as soon as these proceedings are printed.

2. The cost of repairs to the channels of the Sangam anicut project before water is let into them for the first time will be treated as repairs during construction and

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charged to capital account. The Superintending Engineer, II Circle, will apply for such allotment as may be absolutely necessary for repairs chargeable to the revenue account of the system.

3. The Director of Revenue Settlement and Agriculture will, in communication with the Collector of Nellore, report whether the Superintending Engineer's estimate of irrigation revenue during 1884-85, from the Sangam anicut system, may be accepted.

4. The Superintending Engineer, I Circle, will expedite the submission of the schedule of expenditure proposed on the Rushikulya project during the year.

5. The Superintending Engineer, V Circle, will expedite the submission of the revised schedule of expenditure on the works proposed to be executed on the Buckingham canal.

6. The orders of the Government of India will be requested on the suggestion contained in the latter part of paragraph 3 of the note by the Chief Engineer for Irrigation.

(Here enter No. 428 I., dated 29th April 1884.)

(True Extract.)

(Signed) J. O. HASTED, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To Superintending Engineers.
To the Superintendent of Works, Tank Maintenance Scheme.
" Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Revenue Department.
" Financial "

Order thereon dated 30th May 1884, No 2247

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture

(True Extract)

(Sd) C. Bowen
for Ag: Under Secy to Govt.

Exd. A. Aubert.
Spare Copies

To The Board of Revenue
Director of Reve: Settl. + Agre.

Ind. No. 1647/84

IRRIGATION.
ACCOUNT.

Govt. of (1884) Madras.

PUBLIC WORKS.

Proceedings of the Madras Govt. Revenue Deptt. d/ 30th May 1884 No. 2247

Dated April, 29th.

Recd. Encl.

No. 1781/100

Communicated to the officers in charge of Settlement Parties Nos. I, II, III, and V.

(By order)

[signature]
1st Assistant

Deptt. of Reve: Settt. & Agriculture
Madras 5th June 1884

G.O., 29th April 1884, No. 427 I.

APRIL.

To
The Dy: Director of Reve: Settt. Party No. III

Exd. [initials]

Budget Estimates

The final issue of the — of the Irrigation branch, Madras, for 1884-85, drawn up by the Chief Engineer for Irrigation, approved with remarks.

1st May 1884, No. 574, Revenue.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—again G.Os., dated 26th September 1883, No. 1186, and 29th November 1883, No. 1490.

Read—also the following letter from J. MILLS, Esq., M.R.C.V.S., A.V.D., Inspector of Cattle Diseases, to the Director of Revenue Settlement and Agriculture, dated Mount, 21st March 1884, No. 368B; and endorsement by W. WILSON, Esq., Director of Revenue Settlement and Agriculture, dated Madras, 22nd March 1884:—

With reference to G.O., No. 1490, of 29th November 1883, and your Proceedings of 10th November 1883, No. 1550, I have the honor to state that since the assembly of the conference I have devoted considerable time in trying to devise some method by which salt could be rendered unfit for human consumption but at the same time useful for cattle. I am, however, convinced that it is purely a question of chemistry and can only be decided by those who make this branch of science a special study. It, however, would be a great pity if this subject were allowed to drop for want of further experiment, because it is one of such vital importance not only to Government but all owners of stock.

2. I would respectfully suggest that some one who is a chemist may be called upon to decide the question because I have tried blending common salt with other ingredients such as sulphate of soda, sulphate of magnesia, &c.; but on consulting the Chemical Examiner, Dr. Rogers, he informed me that they could be removed by various methods well known to natives, and I fear there will be great difficulty in procuring a substance low enough in price which will chemically combine with salt.

3. I shall be most happy to institute experiments with samples of denaturalised salt to decide whether cattle will or will not consume it, and whether the mixture will prove injurious to health.

Endorsement, No. 742.

Submitted to Government in reference to G.O., No. 1186, dated 26th September 1883, and in continuation of this office No. 1562, dated 13th November 1883.

Order—dated 1st May 1884, No. 574, Revenue.

Separate Revenue, No. 136.
Salt.

Director of Agriculture, Commissioner of Salt Revenue, Inspector of Cattle Diseases, Chemical Examiner.

In the first of the Proceedings read above, the Government communicated to the officers named in the margin the instructions of the Government of India on the subject of devising means whereby salt could be rendered unfit for human consumption so as to allow of its issue, duty free, for use by cattle, and desired that careful and systematic experiments be made in this direction. In the instructions thus issued was included also the cognate question of the denaturalisation of salt in view of its application to the soil as manure.

2. The second Government Order contains the result of a conference held by the officers above named. The conclusion then arrived at was that the problem was incapable of solution; but it was agreed that the Inspector of Cattle Diseases should try such devices as might promise success, and submit them for test by the Chemical Examiner. In the paper now placed before the Government, however, the Inspector of Cattle Diseases reports that he has not been able to discover any ingredients by which salt can be medicated so as to effectually preclude its being used for human consumption.

3. The Right Honorable the Governor in Council, while most anxious to give effect to a measure of such obvious importance to agriculture, is satisfied that no practical result is likely to be attained, under present circumstances, by further discussion in this Presidency as to the means by which salt may be rendered available for agricultural purposes with absolute security to the revenue. The only course which suggests itself to His Excellency in Council as likely to help in solving the problem is to offer a liberal reward of, say, £200 to any one who will invent a chemical process which would effectually satisfy the conditions specified, and a recommendation to this effect will be made to the Government of India.

4. Ordered that the following letter be despatched :—

(Here enter No. 575, dated 1st May 1884.)

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.
,, the Commissioner of Salt Revenue.
,, the Inspector of Cattle Diseases.
,, the Chemical Examiner.

Exd. W. H. French.

100 Copies.

Inw No 1456/84

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 1st May 1884, No. 574.

MAY.

Salt (for cattle).

Considering that no practical result is likely to be attained by further efforts to discover means whereby salt can be made unfit for human consumption so as to allow of its issue, duty free, for cattle; and suggesting, for the consideration of the Government of India, the offer of a liberal reward to any one who will invent a process which will satisfy the conditions desired.

No 1324

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 28th May 1884

(By order)

[signature]

1st. Assistant

To
The Dy: Director of Reve.
Settl. Party No III

No. 58

6TH MAY 1884, NOS. 598, 598A, REVENUE.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 8th March 1884, No. $\frac{829}{\text{Forest 11}}$:—

Read—the following letter from Major I. CAMPBELL WALKER, Conservator of Forests, Southern Circle, to the Secretary to the Board of Revenue, dated Madras, 22nd February 1884, No. 2694 :—

Referring to the Proceedings of the Board of Revenue, dated 14th July last, No. 2024, I have the honor to submit herewith, for their information, a letter from the Collector of Salem and a memorandum drawn up by the District Forest Officer, Malabar, on the subject of wild silks (both in original, to be kindly returned), and to state that copies of these papers, together with two specimens of empty cocoons received from Salem, were forwarded to the officer in charge of the Exhibition Branch, Revenue and Agricultural Department, Calcutta, in October last.

2. The Collector of Malabar promised a supply of cocoons, but could not obtain it in time for exhibition. It is not, of course, possible to send samples of the reeled silk, as there are no filatures.

3. I regret that I am not yet in possession of information sufficient to enable me to suggest, with any degree of probability of final success, steps necessary for the development of the silk-growing industry in the districts of my circle, as required in G.O., dated 18th July 1882, No. 759, Revenue.

The Collector of Malabar, in a letter, dated 1st December 1882, No. 3736, stated "some thirty-five years ago, a Mr. Boyer turned his attention to the production of silk at Pálghat. For three years, under his superintendence, it is said to have rendered good results, but, during his absence, the mulberry plantation was allowed to be over-run with weeds, which took fire and destroyed the plantation. The enterprise does not appear to have been resumed."

4. It would appear also from Colonel Beddome's letter, recorded in G.O., dated 9th August 1880, No. 944, Revenue, that the Mercantile Mission Branch made experiments in South Canara in the same direction some thirteen years ago, but gave it up as a failure.

ENCLOSURE No. 1.

From L. MOORE, Esq., Acting Collector and District Magistrate of Salem, to the Conservator of Forests, Southern Circle, dated 20th October 1883, No. 1077-Forest.

With reference to your letter, No. 1513, dated 5th instant, Mr. Cherry reports as follows :—

"It is very little information I can give you regarding wild silks in this district. I have had no time to devote to the subject.

"2. Enquiries have been made from Dr. Shortt and Dr. Wells, both gentlemen resident in the district, and both much interested in silk culture.

"All forest rangers were also called upon for enquiries.

"3. From Dr. Wells no reply even was vouchsafed although several reminders have been sent him.

"4. Dr. Shortt was good enough to give me the following brief information :—

'I can send you a quantity of cocoons of the *Cricula trifenestrata* and of the *Antheræa mylitta*. Both these moths were introduced on these hills (The Shevaroys) by myself.

'The *Antheræa mylitta* (Tusser silk) is common to the district, and is also found in Salem as well as throughout most parts of Southern India. The *Cricula trifenestrata* I have only met with in Wynaad.

'The silkworms common to these hills are the *Actias selene* and the *Attacus atlas*.'

"5. From the ranges the only information I have is from Hosúr, where the Ranger reports a former large industry especially about Denkanikóta, with the common silkworm. Large plantations of mulberry were raised, but a sickness spread among the worms (a kind of diarrhœa) and as no remedy was found, the worms were lost, the mulberries neglected, and silk culture in the taluk has disappeared.

"6. I believe that silk-farming, especially with the Tusser worm, might be made a success, but it would probably be necessary for the Government to first start small experimental farms.

"7. In this district, the Shevaroy Hills and Hosúr Taluk are good localities. Many trees abound in the district upon which the Tusser worm feeds.

"8. Some of our jungle conservancy topes might be planted up with mulberry with view to possible future experiments with the worms."

Enclosure No. 2.

Memorandum on the Wild Silks of Malabar by R. Morgan, Esq., District Forest Officer, Malabar, dated Calicut, 20th July 1883.

The province of Malabar is situated in the moist zone of the western coast of India. The rainfall varies from 60 to 300 inches a year. The tableland in the eastern portion of the district, known as the Wynaad Plateau, has roughly an average elevation of some 2,500 feet, and is shut off from the lowlands of the district by the chain of the Western Ghâts, which rise in places to 8,000 feet elevation (Camel's Hump) above the sea. The whole of this district is more or less covered with dense forest, and nearly the whole of the province is covered with luxuriant vegetation. Malabar is, in consequence, entomologically speaking, exceedingly rich. To keep up the due balance of nature, and prevent any undue increase of any particular tribes of insect life, other tribes of insects, and a host of enemies besides, have been specially created.

2. Of the family *Saturnüde*, species of five genera are found in Malabar :—

Attacus atlas.—The Atlas moth.
Antheræ mylitta.—The Tusser moth.
Actias selene.—The swallow-tailed moth.
Saturnia.—Sp.
Cricula trifenestrata.—The sociable silk-moth.

3. The Atlas moth (*Attacus atlas*) is found throughout the province, but cannot be said to be abundant anywhere. I have found the larva feeding in Wynaad on *Bischoffia Javanica*, *Wendlandia notoniana*, *Mallotus peltata*, *Eurya Japonica*, on three species of *Tetranthera* and on a host of others too numerous to mention here. The cocoons are of a very dark-brown color and are invariably hidden by leaves, which the larva gums round itself when it commences to spin its cocoon. I have carefully watched those I have collected and brought in from the forests, and when about to spin, they invariably commence by drawing together the edges of the largest leaves they can find, and attaching them to one another by silken threads. Within this leafy screen the cocoon is rapidly perfected, and if the leaves are afterwards removed, it will be found that the cocoon has exactly taken the shape of the leaves, their neuration even being clearly impressed on the silk. The cocoons of this species are never collected or utilized in the district.

It is easily bred under shelter, for I successfully hatched two eggs under a glass shade in my house. The larvæ were fed on *Bischoffia* leaves, throve apace, and spun fine cocoons. The imagos came out in due time and were fine specimens. The larvæ of *Antheræa mylitta* will not stand such confinement, but die when about three-fourths grown.

4. The Tusser silkworm is fairly abundant throughout the district; but the cocoons are exceedingly difficult to find, except in February, when the deciduous forests are bare of leaves. The cocoons are quite equal in size to any I have ever collected in the Kurnool forests or received from Bengal, if not a trifle larger. For an account of some of the experiments I have carried out with this silk-moth, *vide* G.O., No. 946, of the 9th August 1880. Unfortunately, I was unable to carry out the further experiments I then intended, not having been able to avail myself of furlough.

5. There are millions of trees in the forests of Malabar that furnish the favourite food of the Tusser, and there is no doubt that, if a method could be discovered of protecting the larva from its innumerable enemies, at a moderate cost, the cultivation of this and some other wild silks would pay fairly well, and a thriving industry be established.

6. To protect the larvæ, placed on trees in the open air, from their enemies, which are legion, I am positively convinced, will not only never pay, but is nearly impossible. Let us consider first what these enemies are. Here is a list of them :—

Insects.	Animals.	Birds.	Reptiles.
Ichneumon flies of five species. Hornets of twelve species. Wasps of sixteen species. Ants of four species. Mantis six species.	Rats of four or five species. Bats of all species. Tree cats. (*Musanga*).	*All* species of insectivorous or partially insectivorous birds.	Lizards of several species.

The most deadly of all these enemies are the Ichneumon flies, and next the hornets, wasps and ants. Eternal war is waged by these creatures against all insect creation, and if it was not for their services, man would have but a poor chance against his insect foes, notwithstanding the great and efficient help that he is afforded by the feathered creation.

7. The Ichneumon fly, of which there are several species in Malabar, hunts chiefly by day. Watch him and you will see him examining every leaf and bud on a tree. When he espies a caterpillar, he alights near it, and walks round deliberately examining it, to see if it has been previously punctured by any other Ichneumon. If it has—and this is denoted by a series of small black spots along the side of the larva—the Ichneumon leaves it at once, and searches for another. If not, the fly darts its sharp-pointed ovipositor into the side of its writhing victim, and lays an egg between the skin and the stomach of the larva. It repeats this operation till it has laid a number of eggs proportionate to the size of the larva, and then leaves it for another.

8. The Ichneumon larvæ are hatched in a few days, and prey on the juices of the caterpillar, which goes on eating, apparently well, till the larvæ of the Ichneumon, having reached their full size, eat their way out of the caterpillar, which dies. The larvæ of the fly burrow into the ground, and there undergo their transformations. Occasionally, the fly larvæ do not leave the caterpillar till it has spun its cocoon in which they find themselves imprisoned, and after reaching the imago stage, die in it.

9. Of the thousands of worms I put out in my compound in Wynaad, on trees of *Lagerstræmia Flas reginæ*, not *one* lived to spin its cocoon. Day after day, I used to inspect them carefully, and note the destructions going on. Hornets, wasps, and Ichneumons kept buzzing about the trees all day, carrying away the larvæ, whilst armies of ants marched up and down the trunks conveying the helpless little creatures to their underground stores.

10. Now how are we to contend successfully with these infinite hordes of enemies? Well, this is what I propose.

First a wooden building must be put up. It should be 100 feet long × 30 feet broad. It should be moveable, and be merely a framework. The roof should be of Tarpaulins running on rings, so that the building may be made watertight during very heavy rains. The floor should be of Portland cement and have ant-traps, *i.e.*, little hollows 6 inches deep × 2 feet in length, at intervals of every 10 feet round it, which can be baited with fish or meat.

The Portland cement floor should extend for a distance of 10 feet all round, *outside* the building, which must be surrounded with a Portland cement channel full of water—6 inches deep × 2 feet wide. The object of this trench of water is to cut off all communications from outside by which noxious creeping insects might gain access to and injure the silkworms in the building.

Breeding cages made of galvanized wire netting of very fine mesh—each 15 feet × 4 feet and raised 2 feet off the ground—should be arranged in the building, allowing sufficient space between the cages for the (silkworm) attendants to pass freely, and distribute leaves to the worms.

The upper edge of each breeding cage should be lined with glass to prevent the larvæ from crawling on to the lid above, and this glass should be greased to prevent the worms getting any foot hold.

Every breeding cage should be a framework of teak, with the galvanized wire gauze nailed on its inner side. At the bottom, there should be a moveable drawer which should be drawn out and the excreta removed every morning.

Adjoining this building there should be a nursery for the young worms.

This nursery should be an oblong frame 30 feet long × 10 feet high × 15 feet wide, covered with wire gauze and with wooden stands in it, on which should be arranged small trees of *Lagerstræmia microcarpa* grown in tubs. The floor should be of Portland cement and the building should have a moat full of water round it.

The eggs to be tied (in leaf cups) to the branches of these trees, and the larvæ allowed to denude them of leaves, when fresh trees in tubs can be substituted, and the worms transferred by placing green leafy boughs on the denuded shrubs, on to which they will at once crawl, and can thus be bodily transferred to the fresh trees, without there being any necessity for handling them.

When the worms in the nursery are 1 inch in length, they should be transferred to the large breeding room, and placed in the cages, where they should be supplied twice daily with a liberal allowance of leafy twigs at 6 A.M. and 4 P.M. The twigs should be placed on a barred frame at the bottom of the breeding cage, the frame being 1 foot above the drawer at the bottom of the cage. This will allow the excrement to fall through, and at the same time keep the worms clear of it, as it is poisonous to them.

In very hot sunny weather, and in very wet weather, the Tarpaulins should be drawn over the roof; at other times, it should not, for the worms benefit greatly by the admission of sunlight, which, if long withheld, kills them, and by light showers of rain. Although the Tusser worm does not object to hot sun, yet if the building were not covered in such weather, say, from 8 A.M. to 4 P.M., the leaves given to the worms would wither, and be no longer fit food for them.

I would establish such a breeding house in a sheltered position, and in a forest, where ample food for the worms for a radius of 5 miles around could be easily secured.

11. Of course capital is required to start such a scheme, and it could not be well done for less than Rs. 10,000 to commence with, for galvanized wire gauze is very expensive. I wrote to a manufacturer near Euston road, London, and I find the very lowest wholesale rates with discount are considerable.

12. If an experimental trial on a small scale were made, I am confident that, so far as success in breeding the worms is concerned, it would be achieved. It remains to be proved, however, what it will cost to turn out the raw produce, and what comparison the cost will bear to the selling price in the market.

13. *Actias selene.*—This lovely moth is not common anywhere. The larvæ are very handsome, of a bright grass green, with yellow spots on the head.

14. In Malabar, I have only found it feeding on two species of trees, the *Bischoffia Javanica*, and *Wodina wodier*. The cocoon is of a yellowish brown color, and wiry in texture. The cocoon assumes the form of the leaves that the worm cements round it to conceal it from its enemies. I have tried to manufacture, fishing gut from it, and obtained very fine long strands, but owing to some fault in the manufacture, it lacked strength. As a silk producer, it does not seem to me to be worthy of comparison with the Tusser or Atlas worms.

15. The fourth silk-producing moth is a species of the genus *Saturnia*. I discovered the wings of one at Devála in the Wynaad which had been bitten off by a bat, and I again came across another wing near Vellera Mullay in the same vicinity; but these remains were not sufficient to enable me to identify it further. Beyond the fact of the occurrence of a species of *Saturnia* then in the Wynaad, I know nothing further.

16. The sociable silkworm, *Cricula trifenestrata*, is undoubtedly the most abundant species of silk-producer found in Malabar. It is common enough in the plains, but in the Wynaad Plateau, I have seen every tree on 5 or 6 acres of ground entirely denuded of leaves by the larvæ of this species. It particularly affects the *Careya arboreya*, which grows well on the grassy downs in Wynaad. Curiously enough, the caterpillars, which are gray and covered with stinging hairs, never denude the same tree two years successively, thus allowing them a whole season to recover from the check received during the previous one. During the larval stage, it may be said that they have no enemies, for they are able to protect themselves with their poisonous spines; but when they are helpless pupæ, then they are destroyed wholesale, principally by ants.

17. The cocoons, which are of a brilliant yellow color are open and reticulated and the chrysalis is easily visible inside. As a rule, the worms spin in company, and great masses of cocoons, upwards of 20 lb. in weight sometimes, may be seen pendent from the branches of the trees they have denuded of leaves.

18. The silk is very strong and lustrous; but is cemented together very firmly in the cocoon. Doubtless, it could be treated in the same way as Tassa.

19. The difficulty would be to get rid of the chrysalis, and this could only be done by thorough desiccation, to render them inoffensive (for when crushed they putrefy), or by picking the pupa out, which would be not only laborious but would break the fibre of the silk.

20. In Wynaad alone, tons of this silk might be produced without the slightest trouble, if the precaution were taken of collecting the cocoons the moment they are spun, and storing them safely, until the imagos emerge and lay their eggs.

21. The eggs should be hung in cocoanut shells on the branches of careya and mango trees the day they are expected to hatch. No trouble whatever need be taken with the worms afterwards, and nothing has to be done but to collect the cocoons when spun and render them marketable.

22. I have experimented largely with this moth, and have attempted to obtain hybrids between it, and *Bombyx mori*, and *Antherœa myiitta*, but failed. I manufactured a considerable quantity of fishing gut from it, which was very strong; but proved to be too opaque for the purpose for which it was wanted.

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23. There is yet another silk-producing moth in Wynaad—a sociable one. It lays its eggs in company on a species of *Tetranthera*, and the larvæ, of which there are millions, proceed to spin a *net* which entirely covers the tree, and thus protects them from their enemies. Within this net they are secure, and after entirely denuding the tree of its leaves, undergo their change to the pupa state.

24. The silk is very white and glossy and exceedingly strong. I have not yet determined the species or genus to which it belongs; but it is so small that it is hardly worthy of attention, except as a curiosity.

Resolution—dated 8th March 1884, No. $\frac{829}{\text{Forest II.}}$

The information supplied by Dr. Shortt and Mr. Morgan is submitted for the information of Government with reference to G.O., No. 765, dated 21st June 1883.

2. The paper by Mr. Morgan is extremely interesting and valuable, as showing the extreme care that is indispensable in the rearing of Tusser silkworms so as to protect them from their natural enemies. If the Government are not indisposed to make a grant for the purpose of seeing whether the rearing of Tusser worms, in the manner suggested by Mr. Morgan, might not be made commercially successful, the Board recommend that the experiment be carried out by that officer.

(True Copies and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.

Copy to the Conservator of Forests, Southern Circle.
,, the ,, ,, Northern ,,
,, the Deputy Conservator of Forests,
in charge of Central Office of Accounts.
,, the Collector of Salem.
,, the ,, of Malabar.
,, Retired Deputy Surgeon-General J. Shortt, M. D.
,, A. J. Stuart, Esq., M. C. S.

ORDER—dated 6th May 1884, No. 598, Revenue.

Miscellaneous.

The Right Honorable the Governor in Council has read with interest Mr. Morgan's able memorandum on the wild silks of Malabar, but considers that, in view of the small amount of success that has hitherto attended the rearing of the Tusser silk-worm in other parts of India, it is not at present desirable to engage in similar experiments in this Presidency.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

No. 598A.

Copy to the Government of India, Revenue and Agricultural Department, with reference to their Circular No. 36 F. S., dated 25th May 1883.

(Signed) H. E. STOKES,
Secretary to Government.

Exd. W. H. French.

130 Copies.

Dr. No. 431/84

Govt. of {1884} Madras.

REVENUE.

No. 1289

Issued

Recd. Encl.

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 23 May 1884

(By order)

[signature]
1st. Assistant

To
The Dy: Director of Rev: Settt
Party No. III

6
/5/84

G.O., 6th May 1884, Nos. 598, 598A.

MAY.

Wild Silks of Malabar.

Observing that Mr. Morgan's memorandum on the — has been read with interest, and considering that it is not at present desirable to engage in experiments with Tusser silk-worms in this Presidency.

7TH MAY 1884, Nos. 607, 607A, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—again G.O., dated 28th April 1882, No. 435, Revenue, paragraph 4.

READ—again G.O., dated 25th January 1883, No. 104, Revenue, paragraph 8.

READ—again G.O., dated 4th May 1883, No. 550, Revenue, paragraph 2.

READ—again G.O., dated 18th August 1883, No. 1009, Revenue, paragraph 1.

READ—also the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to the Secretary to Government, Revenue Department, dated Madras, 12th December 1883, No. 3221-A :—

I have the honor, in reference to paragraph 8 of G.O., No. 104, dated 25th January 1883, to submit, for the information of Government, two letters, Nos. 2503 and 2618, dated 6th and 13th September 1883 respectively, with their enclosures, received from the Collector of Cuddapah regarding the effect of the recent settlement on the relinquishment of land and the decrease of revenue in the taluk of Jammalamadugu.

2. The Collector, concurring with his Head Assistant, is of opinion that the relinquishments of land and diminution of revenue are due to causes entirely independent of the new settlement.

3. The Head Assistant Collector, after personally examining a considerable number of the relinquished lands, came to the conclusion that, though in a few rare cases the relinquishments *might* have been due to over-assessment under the new settlement, the real causes for the decreases were as follows :—

1st and chief—The loss of life and destruction of agricultural property caused by the famine; the population, which in 1871 numbered 109,965, was, according to the census of 1881, 91,958, being a decrease of $16\frac{1}{3}$ per cent.

2nd—Unfavorable seasons since the famine and the low prices of cotton and indigo, staple products of the taluk.

3rd—The influence of physical causes, such as the impregnation of the soil with salt or its ruin by sand deposited by flood.

4th—The fact that the assessments of the poorer soils before the settlement were in many cases as low as an anna an acre, while the lowest rate under the settlement was four annas or sixpence an acre. The relinquishments of this class of land were, the Head Assistant says, numerous.

4. On the whole the Head Assistant was of opinion that the relinquished lands were not more heavily assessed than their neighbour lands, which are still in occupation, and refers to two facts which tend to prove that the taluk generally was not over-assessed at the recent settlement. These are—

1st—The high selling prices of land—Rs. 100 to Rs. 500 for wet lands and Rs. 30 to Rs. 100 for dry, and

2nd—Last year notwithstanding the imposition in 1881-82 of the village service cess, that is, notwithstanding an addition of $6\frac{1}{4}$ per cent. to the assessment, the revenue of 1882-83 showed a slight increase over that of the previous year. This the Head Assistant hoped was the indication of returning prosperity.

5. On receipt of the order of Government under reference, I requested the Collector to furnish me with a statement of all lands, identifying them by number and class and sort of soil, which, being in occupation at the time of settlement, had been relinquished since its introduction in Jammalamadugu.

6. From the statements forwarded by the Collector, I have had compiled the statement that accompanies this letter.

7. The effect of the settlement introduced in 1872-73 was to increase the area of the taluk by a half per cent. and its assessment by 10. The dry area was increased by half per cent., but its assessment was increased by 13. In wet, with an increased area of 4 per cent., the assessment was reduced by 3.

Vide statement recorded in G.O., No. 919, dated 24th July 1874.

8. The incidence of assessment was (*vide* this office No. 1494-35, dated 11th June 1883, recorded in G.O., No. 1009, dated 18th August 1883,) as follows :—

In dry, the rates of which ranged from As. 4 to Rs. 5, Acres 73,694, or 60 per cent., were assessed at more than a rupee, while, of the remaining Acres 49,609, Acres 13,041, or 11 per cent., were assessed at 1 rupee; Acres 20,607, or 17 per cent., at 8 annas; and Acres 13,763, or 11 per cent., at 4 annas.

The average was Rs. 1-4-5 against the previous average of Rs. 1-2-1.

Vide statement in G.O., No. 919, dated 24th July 1874.

In wet, the rates of which varied from Rs. 2½ to Rs. 12, Acres 3,528, or 80 per cent., were assessed at more than Rs. 5; Acres 642, or 14 per cent. of the remainder, was assessed at Rs. 5; and the remainder at Rs. 4½, Rs. 3, and Rs. 2½.

The average was Rs. 7-9-8 as against the previous average of Rs. 8-2-4.

Vide statement in G.O., No. 914, dated 24th July 1874.

9. Of the lands occupied at settlement, there have been since its introduction relinquished up to, and inclusive of, 1882-83 Acres 10,562·13, assessed at Rs. 11,734-4-4. Of these, Acres 594·60, assessed at Rs. 3,841-0-4, were wet, and Acres 9,967·53, assessed at Rs. 7,893-4-0, were dry. The average assessment of the relinquished lands was in dry Annas 12-8 as against the old average of Annas 8-3, and in wet Rs. 6-7-3 as against the former of Rs. 3-13-0.

The assessment of the wet was increased by settlement from Rs. 2,267-14-3 to Rs. 3,841-0-4, or by 69 per cent., and the assessment of the dry by Rs. 2,770, or by 54 per cent.

Of the area relinquished in dry, Acres 2,433·02, or 25 per cent. of the total dry relinquishments, were assessed at over a rupee an acre; Acres 3,428·30, or 34 per cent., were assessed at 8 annas; and Acres 2,706·64, or 27 per cent., at 4 annas an acre. No less than 61 per cent. of the total dry relinquishments were assessed therefore at sixpence and a shilling an acre.

Of the wet area relinquished, Acres 170·56, or 29 per cent., were assessed at Rs. 7; Acres 295·43, or 50 per cent., at Rs. 7 and over; Acres 110·42, or 19 per cent., at Rs. 6; and Acres 188·75, or 31 per cent., at rates varying from Rs. 5½ to Rs. 2½.

The total area, Acres 10,562·13, of relinquishment, dry and wet, was 8 per cent. of the area, Acres 127,756, in occupation at the introduction of the settlement. The dry area, Acres 9,967·53, relinquished was 8 per cent. of the total dry area occupied when the settlement was introduced, and the wet area relinquished, Acres 594·60, was 13 per cent. of the total wet area occupied at the introduction of the settlement.

The relinquished lands were comprised in 3,272 numbers; in 2,415 of these numbers the assessment was increased from Rs. 4,530-2-4 to Rs. 9,925-0-7, or by 120 per cent.; in 23 of them the assessment was unchanged, and in 834 of them the assessment was reduced from Rs. 2,833-9-4 to Rs. 1,781-14-0, or by 37 per cent.

10. It will be observed that the figures of the statements prepared in this office differ from the jamabandi statements quoted in the order of Government as follows :—

	Area. ACRES.
This office statement	10,562
Jamabandi account	9,759
Difference ...	803

The difference is explained thus: the figures of this office deal only with lands in occupation at settlement and relinquished since, while the jamabandy account is the final balance of the taking up and relinquishment of lands from the year of settlement downwards.

11. The commutation prices adopted for Jammalamudugu were for paddy Rs. 126 and for cholum Rs. 139 a garce.

The market prices of these grains in the Cuddapah district since the introduction of the settlement in 1873-74 till 1882-83 were as follows:—

Year.	Paddy. RS.	Cholum. RS.
1873-74 ...	154	199
1874-75 ...	138	182
1875-76 ...	156	191
1876-77 ...	310	443
1877-78 ...	358	500
1878-79 ...	242	339
1879-80 ...	184	247
1880-81 ...	175	165
1881-82 ...	167	152
1882-83 ...	170	168

The commutation prices have thus so far been well under the market prices, and on the whole I see no reason for thinking that the taluk has been over-assessed, or that the relinquishments and decrease of revenue are due to excessive rates.

ENCLOSURE—No. 1.

Letter from L. R. BURROWS, Esq., Acting Collector of Cuddapah, to the Director of Revenue Settlement and Agriculture, dated Cuddapah, 6th September 1883, No. 2503.

With reference to your letter, No. 910-192, dated 9th April last, I have the honor to forward herewith copy of a letter * received from the Head Assistant Collector, Cuddapah, and of my reply thereto. The matter is receiving attention and will be sent up as soon as possible.

* No. 289 of 26th July 1883.

ENCLOSURE—No. 2.

Letter from W. C. HOLMES, Esq., Acting Head Assistant Collector, to the Collector of Cuddapah, dated Cuddapah, 26th July 1883, No. 289.

I have the honor to enclose a statement showing the fields which were under cultivation at the time of the new settlement, but which were relinquished since then and were not occupied in fasli 1292 ending 31st June 1883.

2. This statement was called for by the Director of Revenue Settlement and Agriculture in his letter to you, No. 910-192, dated 9th April 1883.

3. The new rates of assessment were introduced in the Jammalamadugu Taluk in fasli 1284 (1874-75), and since then an area of 10,439 acres 68 cents,* bearing an assessment of Rs. 11,826-10-11,† has gone out of cultivation. The number of fields or sub-division of fields that have been relinquished is 3,243,‡ and among these the assessment on 836 § fields was decreased, and in the case of 23 fields no change was made. This fact seems to point to some cause for the decrease in cultivation other than the increase of assessment. From the inquiries I have made I am led to believe that the main reason for the relinquishments is the loss of life and the destruction of agricultural capital that was caused by the famine, and it seems that unfavorable seasons since and the low prices of cotton and indigo—staple products of the taluk—have retarded the recovery by the people of their former position. The population of the Jammalamadugu taluk, according to the census returns of 1871, was 109,841,‖ but in 1881 the population had fallen by 17,883 ¶ inhabitants to 91,958. These figures, considering that the population is almost wholly agricultural, seem to support the opinion as to the cause of the relinquishments which I have just stated.

* Should be Acres 10,562·13.
† Should be Rs. 11,734-4-4.
‡ Should be 3,272.
§ Should be 834.
‖ 109,965.
¶ 17,997.

I give in the margin the assessment of occupied lands in the taluk from fasli 1280 to fasli 1291. When the new rates of assessment were introduced in fasli 1284 (1874-75) the land revenue was raised by Rs. 17,006, or by 10 per cent. on the land revenue of previous fasli 1283 (see margin and compare paragraph 3 of Director of Revenue Settlement's report embodied in Proceedings of Board of Revenue, No. 1622, dated 29th June 1874). Two years after this, that is, in fasli 1286, the famine commenced, but I notice that both in fasli 1285 and in fasli 1286—the famine could not have affected the relinquishments for that fasli—there was a decrease in the land revenue of Rs. 3,804 and of Rs. 1,392 respectively. This seems to indicate a rate of assessment on some lands that was too high. In fasli 1287 an increase in the assessment of occupied land of Rs. 697 * occurs—an increase which the liberal remissions given in fasli 1286, but which were not continued, may account for—but in the next four faslis there was a decrease of Rs. 574, Rs. 2,888 Rs. 1,193, and Rs. 2,884 † respectively. In the fasli just closed, 1292, there has been a small increase of Rs. 32 ‡ according to the taluk figures, and this notwithstanding the collection of village cess of one anna in each rupee of assessment for the first time in fasli 1291. This cess is, of course, equivalent to an increase in the assessment of 6¼ per cent. It would be too early perhaps to draw any inference from the slight increase in fasli 1292, but I hope that it indicates the commencement of a return of prosperity.

Fasli.		RS.		RS.
1280	.. ..	1,77,268		
1281	.. ..	1,74,737	—	2,531
1282	.. ..	1,75,884	+	1,147
1283	.. ..	1,78,059	+	2,175
1284	.. ..	1,95,065	+	17,006
1285	.. ..	1,91,261	—	3,804
1286	.. ..	1,89,869	—	1,392
1287	.. ..	1,90,564	+	695
1288	.. ..	1,90,004	—	560
1289	.. ..	1,87,116	—	2,888
1290	.. ..	1,85,917	—	1,199
1291	.. ..	1,83,039	—	2,878

* Should be Rs. 695.

† Should be Rs. 560, Rs. 2,888, Rs. 1,199, and Rs. 2,878.

‡ Should be Rs. 35.

Of course the question now is whether the late assessments should be revised. There may be some cases in which the land is assessed so highly that its cultivation would not be profitable, but I believe these cases are few. In the vast majority of cases the cultivator's interest in his holding is very valuable, amounting to twenty, thirty, forty, or more times the assessment, wet lands selling at from Rs. 100 to Rs. 500 and dry lands from Rs. 30 to Rs. 100 an acre.

The Acting Tahsildar of Jammalamadugu in his arzi, No. 329, dated 6th July (enclosed), expresses an opinion that the assessment is too high in the following villages :—

1. Jangalapally.
2. Suddapalle.
3. Peddamudiam.
4. Muddanúr.
5. Uppaloor.
6. Yetoor.
7. Thalla Proddutúr.
8. Umkayya Calva.
9. Pamaloor.
10. Bondalacanta.

But, according to paragraph 5 of the Director of Revenue Settlement's report before alluded to, there was no considerable enhancement of assessment except in the first four of these villages.

ENCLOSURE—No. 3.

Letter from L. R. BURROWS, Esq., Acting Collector, to the Acting Head Assistant Collector of Cuddapah, dated Cuddapah, 9th August 1883, No. 2234.

With reference to your report, dated 26th July 1883, No. 289, I have the honor to request that you will be good enough to inspect personally about twenty relinquished fields in at least four different villages, selecting those by preference in which the assessment has been increased the most, and that you will record your opinion in each case as to whether the increase appears to have been justifiable. In order to enable you to pursue the method adopted by the Settlement Department, I forward a book of instructions lately received from the Director for your guidance.

2. I agree generally with the views expressed in your report, but the question to be decided is whether the assessment of the relinquished fields ought to be revised, and this cannot be done without some information such as that which I now request you to supply.

ENCLOSURE—No. 4.

Letter from L. R. BURROWS, Esq., Acting Collector of Cuddapah, to the Director of Revenue Settlement and Agriculture, in charge of Inam Department, dated Cuddapah, 13th September 1883, No. 2618.

I have the honor to forward herewith a statement in two parts showing the lands remaining unoccupied out of those relinquished in Jammalamadugu taluk in faslis 1284—1292 inclusive, and a copy of a letter from the Acting Head Assistant Collector, dated 6th September 1883,

No. 358. The copy of this letter and that forwarded with mine, dated 6th instant, No. 2503, show satisfactorily that the relinquishment of lands in Jammalamadugu taluk is not caused by the introduction of the new settlement rates. The statements of the other taluks of the principal division will be forwarded as soon as they are received.

Enclosure—No. 5.

Letter from W. C. HOLMES, Esq., Acting Head Assistant Collector, to the Collector of Cuddapah, dated Jammalamadugu, 6th September 1883, No. 358.

With reference to your letter, No. 2234, dated 9th August 1883, I have the honor to state that I have inquired into the cause of the relinquishments and inspected the fields relinquished in a number of villages in the neighbourhood of Muddanúr and Jammalamadugu. I have found as yet no case of excessive assessment.

2. The lowest rate that the Settlement Department has imposed is four annas an acre on the principle, I presume, that, if the land is not worth that, it can hardly be called arable land. Before the new assessment ryots could hold land paying a rent of an anna an acre and would cultivate it once in three or four years, but now in many cases the land would be relinquished when the rent is raised to four annas an acre. I found many instances of relinquishments in Muddanúr and neighbouring villages from this cause. I instance fields Nos. 206, 252, 236, 225, 216, 2, 3, 12, 13, 28, 183, and others. These fields are close up to the Yerramallas (Red Hills), and the soil is very poor indeed; they are the farthest away from the village, and therefore the most difficult to cultivate. They are, in fact, exactly the lands that after bad seasons we could expect to be first relinquished.

3. I found also that a number of fields were relinquished as the land had become saline. I instance fields Nos. 255, 257, and 254 in Muddanúr, which had been irrigated from a well with bad water.

4. Muddanúr may be considered as typical of the villages in its neighbourhood, and I found that, with some exceptions, the causes of relinquishments in them were the same as in Muddanúr. I have examined the fields relinquished in Jammalamudugu, Ponnathota, and Gudemcheruvu, three villages on the banks of the Pennér. I selected the two latter villages, as the assessment on the relinquished lands had been proportionately more raised than in any other villages in the neighbourhood of my present camp at Jammalamadugu. In all these villages I found that the relinquishments were made for reasons independent of the recent revision of the assessments. A considerable number of fields along the river had been covered with sand and were useless for cultivation purposes. In other fields the ground was saline, and the ryots, with their diminished resources, did not consider it would pay them to cultivate it.

5. In your letter under reply you ask whether the increase that you noticed in the assessment on certain fields was justifiable. As far as I saw, the assessments on relinquished fields were not comparatively higher than on the fields in their neighbourhood. I could do no more than this and was not able to follow the method adopted by the Settlement Department in fixing the assessment, because I do not know the data on which the department worked, but the fact that I did not find any obvious inequality of assessment proves, I think, that, if there are faults to be found with the assessment, their cause must be looked for in the *data* themselves.

6. The enclosure of your docket, No. 2300, dated 15th August 1883, is returned.

Read—also the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to the Secretary to Government, Revenue Department, dated Madras, 31st March 1884, No. 1038A-40B :—

In my letter, No. 1494-35, dated 11th June 1883, I reported, in reference to G.O., No. 550, dated 4th May 1883, on the incidence of the new rates of assessment in the Cuddapah district generally, including the four taluks of the sub-division, and in my letter, No. 3221A, dated 12th December 1883, I reported on the incidence of the new assessments in the Jammalamadugu taluk both generally and particularly as regarded the area relinquished since the introduction of the new settlement. I now submit a similar report on the incidence of the assessments in the seven taluks* of Cuddapah below ghât, particular information regarding which it is that I understand the Government to be desirous of having. The assessment of the sub-division taluks is, as remarked in my letter, No. 567-13,† dated 2nd March 1883, in my opinion extremely moderate.

* Cuddapah. Jammalamadugu. Proddutúr. Badvél. Sidhout. Pullampet. Pulivendla.

† *Vide* G.O., No. 966, dated 9th August 1883.

2. According to the introduction reports, the result of the survey and settlement was an increase* of 5 per cent. in the area of dry land and of 11 per cent. in its assessment and an increase of 9 per cent. in the area of wet land and of 10 per cent. in its assessment. The increase on the whole was 5 per cent. in area and 11 per cent. in assessment.

* *Vide* Enclosure 1 to Statement A.

3. The incidence of assessment was as follows (*vide* Statement A):—

In wet, the rates of which varied from Rs. 12 to Rs. 2, Acres 50,815, or 80 per cent. of the total wet area of Acres 63,881, was assessed at Rs. 5 and upwards; Acres 14,664, or 23 per cent., were assessed at Rs. 7; and Acres 17,746, or 28 per cent., at over Rs. 7 an acre. Acres 4,249, or 7 per cent. of the area, was assessed at Rs. 10 an acre; Acres 6,385, or 10 per cent., were assessed at Rs. 4½, while no area at lower rates stood for more than 3 per cent. of the whole.

In dry, the rates for which varied from Rs. 5 to Annas 4, Acres 174,296, or 27 per cent., were assessed at Annas 8 an acre; Acres 151,795, or 24 per cent., at Rs. 1¼; Acres 151,294, or 23 per cent., were assessed at over Rs. 1¼; while Acres 3,37,798, or 53 per cent., were assessed at rates varying from a rupee downwards, Acres 70,132, or 11 per cent., being assessed at Annas 4.

4. Since the introduction of the new rates, there have been relinquished in these taluks Acres 83,990 comprised in 25,305 fields, assessed before the settlement at Rs. 60,212 and by the settlement at Rs. 94,365, representing an increased assessment of over 57 per cent.

Of this area the assessment of Acres 63,907, comprised in 17,826 numbers, was raised from Rs. 35,421 to Rs. 79,330, or by nearly 124 per cent.; the assessment of Acres 19,546, embraced in 7,243 numbers, was decreased from Rs. 24,208 to Rs. 14,452, or by nearly 40 per cent.; and the assessment of Acres 537, comprised in 236 numbers, remained unchanged. These figures will show that the decrease since the settlement in the occupation and assessment of these taluks is not *entirely* due to the revised settlement.

Vide Enclosure 2 of Statement A.

5. Of the 6,473 acres of wet land that have been relinquished since the settlements up to, and inclusive of, 1882-83, Acres 1,649, or 25 per cent., were assessed at Rs. 7, a rate which, as shown above, applied to 23 per cent. of the total wet area; Acres 1,121, or 17 per cent., were assessed at Rs. 5, a rate which stood for 14 per cent. of the wet area; Acres 698, or 11 per cent., were assessed at Rs. 4½, a rate which embraced 10 per cent. of the total wet area; Acres 555, or 9 per cent., were assessed at Rs. 8, and Acres 445, or 7 per cent., at Rs. 9. No other area of relinquishment stood for more than 6 per cent.

6. The total wet area relinquished was 10 per cent. of the total area of wet land occupied in the years that the several settlements were introduced. The assessment of the wet area relinquished was increased from Rs. 18,396 to Rs. 38,568, or by 109 per cent. The average assessment of these lands was Rs. 2-13-6 before the settlement and Rs. 5-15-4 after it.

7. Detailed lists showing the old and new assessments and the soil classification of every field that has been relinquished since the settlements have been received from the Collector, and from them have been picked out the more striking cases of individual increases in the wet lands and embodied in the accompanying Statement B. From these it will appear that one-third of the wet lands relinquished in the Cuddapah taluk were before the settlements assessed at some 10 annas an acre; about one-fourth of the relinquishments in Jammalamadugu at some 12 annas an acre; more than half of the relinquished area of Badvél at less than half a rupee an acre; more than half of the relinquished area in Sidhout at some 12 annas an acre; and a fourth of the relinquished area of Pullampet at the same rate.

The lowest wet rate in the Cuddapah as in all other revised settlements was Rs. 2 an acre, and irrigated land that cannot bear *that* assessment cannot be worth irrigating at all.

8. In dry there have been relinquished up to, and inclusive of, 1882-83 Acs. 77,517, which were assessed at Rs. 41,816 before the settlement and at Rs. 55,797 after it. The average rate per acre of these lands was Annas 8-7 before the settlement and Annas 11-6 after it. The total area relinquished was 12 per cent. of the total dry area occupied in the years the various settlements were introduced.

9. Of the area relinquished, Acres 30,210, or 39 per cent., were assessed by the settlement at 8 annas an acre, and Acres 18,775, or 24 per cent., at 4 annas—that is, the lowest settlement rate there is—an acre ; nearly two-thirds of the area of relinquishment therefore was assessed at the very moderate rates of 4 and 8 annas an acre.

The next highest area of relinquishment was Acres 10,840, or 14 per cent., which were assessed by the settlement at Rs. $1\frac{1}{4}$. Acres 60,278, or 78 per cent. of the whole, were assessed at rates varying from a rupee down to four annas an acre.

10. The area of dry relinquishments was nearly twelve times as large as that of wet, but, as shown above, the incidence of the new assessments on the dry lands relinquished was extremely moderate.

11. In his letter, No. 2618, dated 13th September 1883, submitted with my report on Jammalamadugu, No. 3221-A, dated 12th December 1883, the Collector expressed the opinion that the relinquishments were due to causes entirely independent of the revision of the settlement and the increase of rates. In his letters as per margin, reporting on the other plain taluks of the district, the Collector expresses the same opinion in the case of all but Badvél, Sidhout, and Pullampet, where, accepting the opinion of the Deputy Collector in charge, he considers that to the increased settlement assessments chiefly are due the relinquishments that have occurred then.

Vide letter, No. 2685, dated 22nd Sept. 1883.
Vide letter, No. 2813, dated 2nd Oct. 1883.
Vide letter, No. 2981, dated 15th Oct 1883.

12. An examination of the statistics of these taluks shews that there were relinquished Acres 29,636 of dry land and Acres 3,680 of wet.

The dry relinquishments were 20 per cent. of the total dry occupation at the date of settlement, and the wet 11 per cent. of the wet area then occupied. The assessment of the dry relinquishments was increased from Rs. 12,212 to Rs. 17,040 or by 40 per cent. ; the assessment of the wet area relinquished was increased from Rs. 8,252 to Rs. 21,488 or by 160 per cent.

The average assessment of the dry relinquishments was Rs. 0-6-7 before the settlement and Rs. 0-9-2 after it. The average assessment of the wet relinquishments was Rs. 2-3-10 before the settlement and Rs. 5-13-4 after it.

Of the wet relinquishments, Acres 872 or 23·6 per cent. were assessed at Rs. 7 an acre, Acres 564 or 15·2 per cent. at Rs. 5 an acre, Acres 480 or 13 per cent. at Rs. 6 an acre, and Acres 420 or 11·4 per cent. at Rs. 8 an acre. No other rate stood for more than 9·8 per cent—this was the Rs. $3\frac{1}{2}$ one.

Of the dry relinquishments, Acres 11,522 or 38·9 per cent were assessed at 8 annas an acre, Acres 8,575 or 28·9 per cent. at 4 annas an acre, while Acres 28,118 or 95 per cent. were assessed at rates varying from 1 rupee downwards.

Of the dry lands relinquished the highest percentage for rates above 1 rupee was 2·1 ; this occurred under the Rs. $1\frac{1}{2}$ rate ; the next highest area of relinquishment in rates over a rupee was 0·7 per cent. under Rs. $1\frac{3}{4}$.

The incidence of assessment on the dry relinquishments will thus appear to have been exceedingly moderate in these taluks also.

The dry relinquishments in these three taluks were about 8 times as extensive as the wet, and the lands relinquished in them and in the district generally belonged for the most part to the most moderately assessed classes.

13. According to the Census of 1881, the population of the 7 plain taluks of Cuddapah was less by 17 per cent. than it was in 1871. To this and to the loss of agricultural stock in the famine of 1876—78 and to the very low rates that often prevailed for dry lands before the settlement (*vide* Head Assistant Collector's letter, No. 289, dated 26th July 1883, enclosed in this office No. 3221-A, dated 12th December 1883, on Jammalamadugu) must, I think, be chiefly ascribed the gradual decrease since the revision of the settlements in the area of occupation and in the revenue that has attracted the attention of the Secretary of State.

ENCLOSURE NO. 1.

ABSTRACT.—Statement A showing the area occupied in the years of the several settlements and that relinquished since those years up to Fasli 1292 (1882-83) in the seven plain taluks of the Cuddapah district.

ENCLOSURE NO. 2.

ABSTRACT.—Statement B showing the more striking cases of increased assessments in the Cuddapah district.

ENCLOSURE NO. 3.

Letter from H. R. FARMER, Esq., Acting Sub-Collector in charge, Cuddapah, to the Director of Revenue Settlement and Agriculture, dated Kódúr, 22nd September 1883, No. 2685.

With reference to your footnote No. 1284-268, dated 16th May 1883, on G.O., No. 550, dated 4th May 1883, I have the honor to forward herewith a statement showing the lands relinquished in Cuddapah taluk and remaining unoccupied since the introduction of the new settlement rates, as well as a copy of a letter from Temporary Deputy Collector, dated 12th instant, No. 285, and to state that the relinquishment of lands in this taluk is not caused by the introduction of new settlement rates. The statement of the other five taluks of the principal division will be forwarded as soon as they are received.

ENCLOSURE NO. 4.

Letter from B. VENCATA RAO, Temporary Deputy Collector, to the Acting Collector of Cuddapah, dated Cuddapah, 12th September 1883, No. 285.

In submitting the statement received from the Tahsildar of Cuddapah, in accordance with your footnote, No. 1456, dated 1st June 1883, I have the honor to report as follows.

2. The total area relinquished from the introduction of the new settlement to the end of last fasli as shown in the statement is 14,076-73, which was assessed at Rs. 10,956-5-11 previous to the settlement, and at Rs. 15,700-8-5 in the settlement. The excess is Rs. 4,744-2-6. The reasons for having relinquished the above lands are found to be as follows. Of course most of the lands relinquished are dry :—

1st.—Some of the dry and wet lands of inferior quality having been charged in the new settlement with a higher rate of assessment than in the old settlement.

2nd.—The dry lands of inferior quality having become unprofitable year after year (1) for want of periodical rains, (2) on account of inability of ryots to manure them, having well irrigated and other superior dry lands to be better looked after and manured.

In fact, unirrigated dry lands will not be manured at least once in ten years unless they are very superior. The dry lands of inferior quality, if cultivated one year with cholum or horse-gram, will be rendered unfit for cultivation in the following year owing to the inability of the ryots to manure them, and for want of timely rains. Consequently they will be relinquished and left waste for one or two years, and taken up again. A memorandum containing the reasons given by the Tahsildar is enclosed with his Arzee, No. 375, dated 22nd August 1883, for your information.

3. The statement does not contain the information required for seven villages to complete the whole taluk and it will be submitted as soon as received from the tahsildar.

ENCLOSURE NO. 5.

Letter from C. KOUGH, Esq., Acting Collector of Cuddapah, to the Director of Revenue Settlement and Agriculture, Madras, dated Cuddapah, 2nd October 1883, No. 2813.

With reference to your footnote, No. 1284-268, dated 16th May 1883, on G.O., No. 550, dated 4th May 1883, I have the honor to forward herewith two registers showing the number of fields relinquished since the introduction of the new settlement rates both in the taluks of Proddutur and Pulivendla.

2. The total assessment in Fasli 1284, in which settlement rates were introduced in Proddutur taluk, was Rs. 1,74,224 or Rs. 6,741 in excess of that of the previous year. The increase in assessment does not therefore seem considerable.

3. The Head Assistant Collector attributes the heavy number of relinquishments subsequent to Fasli 1284, to the effects of famine, but not to the increase of assessment. I concur with him in his opinion.

4. The total assessment in Fasli 1289, in which new settlement rates were introduced in Pulivendla taluk, was Rs. 1,85,145 or Rs. 33,039 in excess of that of the previous year. The increase in this taluk appears considerably large.

5. I agree with the Head Assistant Collector in supposing that the relinquishments in Pulivendla taluk are due partly to the increase of assessment and partly to the effects of famine.

6. I have the honor to forward copies of letters, Nos. 375 and 376, dated 21st September 1883, received from the Head Assistant Collector on the subject.

Enclosure No. 6.

Letter from W. C. HOLMES, Esq., Acting Head Assistant Collector, to the Acting Collector of Cuddapah, dated Cuddapah, 21st September 1883, No. 375.

In reply to your footnote, No. 1456, dated 1st June 1883, I have the honor to forward a statement showing the lands relinquished in Proddutur taluk since the introduction of the new settlement rates.

2. Of land occupied at the time of the settlement, 14,591 acres, bearing an assessment of Rs. 19,225, have been relinquished.

3. The Tahsildar in a note at the foot of the statement attributes the decrease "partly" to the increased assessment. The total number of fields or subdivision of fields which have been relinquished is 3,518, and among these 1,139 have now a smaller assessment than they had previous to the introduction of the new rates and the assessment remains the same in the case of 48 fields. These figures show that the increase in the assessment was not the sole cause at any rate of the decrease in cultivation. The increase of assessment was small in this taluk; and the taluk suffered severely from famine and, as in the case of Jammalamadugu, I look on this as the main cause of the relinquishments.

Fasli.	RS.	RS.
1280	1,68,132	..
1281	1,67,449	— 683
1282	1,67,412	— 37
1283	1,67,483	+ 71
1284	1,74,224	+ 6,741
1285	1,70,258	— 3,966
1286	1,68,738	— 1,520
1287	1,69,740	+ 1,002
1288	1,69,911	+ 1,173
1289	1,66,828	— 3,083
1290	1,65,306	— 1,522
1291	1,64,157	— 1,149
1292	1,63,172	— 985

4. You will see from the figures quoted in the margin the progress of the assessment on occupied lands in the taluk for the past 13 years. You will see that the difference between the figure for the year 1284, the year in which the new rates were introduced, and the figure for last fasli is Rs. 11,049—a sum which differs considerably from Rs. 19,225, the assessment on the lands relinquished. The reason of this difference is chiefly that, although some lands were relinquished, others which were not cultivated in Fasli 1284 have since been occupied.

Enclosure No. 7.

Letter from W. C. HOLMES, Esq., Acting Head Assistant Collector, to the Collector of Cuddapah, dated Cuddapah, 21st September 1883, No. 376.

I have the honor to forward a statement showing the lands relinquished in Pulivendla taluk since the introduction of the new settlement.

2. Of lands occupied at the time the new rates of assessment were imposed, 10,333 acres, with an assessment of Rs. 9,627, have been relinquished.

3. The new rates were introduced in Fasli 1289, and the assessment on occupied lands for that year was Rs. 1,85,145; last Fasli 1292 the assessment was Rs. 1,79,636, the decrease being Rs. 5,509.

4. This shows that, although 10,333 acres were relinquished, land previously unoccupied was taken up by the ryots.

5. As in the case of Jammalamadugu and Proddutur a considerable number of the fields relinquished bear a lower assessment than they formerly did. The proportion, however, is not

nearly so large as in the other taluks, and this may be accounted for by the heavy increase of 27 per cent. on the old rates that the new assessment was (see Board's Proceedings, No. 2849, dated 8th October 1879). I notice, with one exception, for eight years previous to the introduction of the new rates, that is, in Fasli 1289, the assessment on occupied lands was gradually decreasing. The exception was the year after the famine, Fasli 1287, in which there was a trifling increase of Rs. 238, and this I can only attribute to the liberal remissions that were granted in Fasli 1286. I give the figures showing the assessment for a series of years in the margin.

Fasli.	RS.		RS.
1280	1,56,809		..
1281	1,56,502	—	307
1282	1,55,893	—	609
1283	1,54,943	—	950
1284	1,54,672	—	271
1285	1,53,982	—	690
1286	1,52,702	—	1,280
1287	1,52,940	+	238
1288	1,52,106	—	834
1289	1,85,145	+	33,039
1290	1,81,141	—	4,004
1291	1,80,618	—	523
1292	1,79,636	—	982

ENCLOSURE No. 8.

Letter from C. KOUGH, Esq., Acting Collector of Cuddapah, to the Director of Revenue Settlement and Agriculture, dated Cuddapah, 15th October 1883, No. 2981.

With reference to your footnote, No. 1284-268, dated 16th May 1883, on G.O., No. 550, dated 4th May 1883, I have the honor to forward herewith the statement of lands relinquished since the introduction of the new settlement rates in Badvél, Sidhout and Pullampet taluks, as well as copy of letter No. 301, dated 30th September 1883, received from the General Duty Deputy Collector.

2. From this I gather that the high rates in the new settlement form the principal cause for the heavy relinquishment of lands.

ENCLOSURE No. 9.

Letter from M.R.Ry. A. KRISHNA ROW, Garu, General Charge Deputy Collector, to the Collector of Cuddapah, dated Sidhout, 30th September 1883, No. 301.

With reference to footnote, No. 1456, dated 1st June last, to G.O., R. D., No. 550, dated 4th May last, received with the Director of Revenue Settlement's endorsement No. 1284-268, dated 16th idem, I have the honor to forward herewith the statements of lands relinquished since the introduction of the new settlement in the three taluks under my charge.

2. The statements show the assessment which the lands relinquished bore prior to the settlement, and that fixed on them at the settlement. Comparison of these assessment figures indicates plainly that the incidence of the revised land-tax is much higher than the old one, and though there are cases of relinquishment of lands more lightly assessed at the settlement attributable either to the inherent unfruitfulness of the soils, or to the inability of famine-stricken ryots to bring the full extent of their holdings into cultvation, the conclusion is inevitable that the chief element which has operated to bring in the bulk of relinquishments is the high rate of new settlement assessment.

ORDER—dated 7th May 1884, No. 607, Revenue.

Land Revenue, No. 70.

In the two papers last read the Director of Revenue Settlement furnishes the report called for regarding the incidence of the new rates of assessment in the district of Cuddapah. In his first letter he reports on the Jammalamadugu taluk to which the inquiry was originally restricted, and in the second on all the seven * below-ghât taluks including Jammalamadugu, on account of the inquiry having subsequently, under the instructions of the Secretary of State, been ordered to be extended to the whole district. Mr. Wilson leaves out the four † above-ghât taluks which constitute the sub-division, because these were only recently brought under the new settlement, and because the rates of assessment introduced therein being extremely moderate, the question of the bearing of the new assessment on relinquishments of land does not arise.

* Cuddapah.	Sidhout.
Jammalamadugu.	Pullampet.
Proddutur.	Pulivendla.
Badvél.	
† Ráyachóti.	Kadiri.
Váyalpád.	Madanapalle.

2. Mr. Wilson goes into the subject very fully, and on careful consideration of the statistics placed before the Government, the Right Honorable the Governor in Council is satisfied that the relinquishments subsequent to the new settlement are traceable but to a small extent to rates of assessment.

3. The new settlement was introduced in the seven taluks under consideration in the course of six years, Faslis 1282 to 1287,* and the total extent of land relinquished in these taluks, subsequent to the new settlement down to Fasli 1292,† is 83,990 acres, being nearly 12 per cent. of the total area occupied in the years of the settlement. Of this extent, on 20,083 acres or nearly one-fourth the assessment had been either reduced or left unchanged,‡ and this fact shows *per se* that the relinquishments are not due entirely to the new rates of assessment.

* 1872-73 to 1877-78.

† 1882-83.

‡	ACRES.
Reduced	19,546
Left unchanged	537

4. Details as to dry and wet and rates of assessment are not given separately for the area (63,907 acres) on which the rates had been raised, and the following analysis, therefore, refers to the whole extent relinquished (88,990 acres). Of this, by far the larger proportion, viz., 77,517 acres, was dry; and the assessment thereon had been raised from Rs. 41,816 to Rs. 55,797, giving an average of Rs. 0-11-6 per acre against Rs. 0-8-7 before the new settlement. Of this extent, however, as will be seen by the marginal table, 71,121 acres or nearly 92 per cent. were assessed at rates from Rs. 1-4-0 downwards to 4 annas, while out of this 71,121 acres, no less than 48,985 acres or more than 63 per cent. were under the 8 and 4-anna rates. This analysis is sufficient to show the moderation of the new assessment.

Rates. RS. A. P.	Extent. ACRES.	Rates. RS. A. P.	Extent. ACRES.
5 0 0	42	0 12 0	2,687
4 0 0	165	0 10 0	3,483
3 0 0	916	0 8 0	30,210
2 4 0	13	0 4 0	18,775
2 0 0	2,373	Special	3
1 12 0	1,452		
1 8 0	1,435		77,517
1 4 0	10,840		
1 0 0	5,123		

5. It is true that the increase of assessment in the aggregate on the dry area given up was considerable; but it is to be remembered that the old rates were in many cases exceptionally low and on the whole based on no recognised principle. With a rate so low as an anna an acre, the ryot was not concerned to relinquish from his holding unprofitable land, cultivating and taking what he could out of it once in three or four years; in fact, it was not in view of any profit but of the trivial amount of loss involved that he retained the land. With a four-anna rate—the lowest the Settlement Department imposes—, however, the ryot would naturally give up the land, and it is to this extent alone that the new settlement can be said to have induced relinquishments of dry land. As pointed out by Mr. Holmes, the Head Assistant Collector,§ in the case of the Jammalamadugu taluk, if the land is not worth a four-anna rate, it can hardly be called arable land.

§ His letter, dated 6th September 1883, No. 358, paragraph 2.

6. On the whole, the conclusion to which His Excellency in Council is drawn with regard to the relinquishments of dry area is that, as observed by the Director of Revenue Settlement, they are ascribable primarily to the loss of population and agricultural stock during the late famine (the population by the Census of 1881 was 17 per cent. less than in 1871), and to a certain extent to the enhancement of the very low rates which prevailed before the new settlement and which admitted of the retention in ryots' holdings of very inferior lands which would hardly yield a profit to the holder in addition to a moderate assessment to Government.

7. The late Acting Collector, Mr. Kough, adopting the opinion of the Deputy Collector in charge, considers that, in the case of the three taluks of Badvél, Sidhout and Pullampet, the relinquishments are due chiefly to the enhanced rates of assessment; but neither he nor his deputy goes sufficiently into details. These taluks do not present any features which can be regarded as distinguishing them from the rest, and the separate analysis of the statistics regarding them given in Mr. Wilson's report tends to the same conclusion as in the others discussed.

8. The wet area thrown out of occupancy, though as much as 10 per cent. of the total wet area occupied in the years the new settlement was introduced, is comparatively small, being only 6,473 acres in the seven taluks; but very nearly three-fourths of it (4,804 acres) was under the higher rates, from Rs. 5 to Rs. 12 per acre.* The assessment on this area was increased at the new settlement from Rs. 18,396 to Rs. 38,568 or 109 per cent., raising the average per acre from Rs. 2-13-6 to Rs. 5-15-4. On lands retained in holding the proportion of increase is less than 5 per cent.† The Government find it difficult to believe that irrigated lands capable of yielding a profit (taken as equal to Government assessment) of from Rs. 5 to 12 an acre, would have been given up, or, if given up for want of stock and labor, would not, with the returning prosperity of which there are sufficient indications, have been subsequently taken up again. In some cases, no doubt, the relinquishments are due to the operation in recent years of physical causes such as the impregnation of the soil with salt and the formation of sand deposits, both of which causes are specifically adduced by Mr. Holmes in regard to certain localities in Jammalamadugu; but the Government apprehend that the explanation of the state of things above noticed is to be found more generally in the deteriorated state of irrigation works.

Rates.			Extent.	Rates.			Extent.
* RS.	A.	P.	ACRES.	RS.	A.	P.	ACRES.
12	0	0	2	4	0	0	212
10	0	0	125	3	8	0	360
9	0	0	445	3	0	0	158
8	0	0	555	2	8	0	235
7	0	0	1,649	2	0	0	6
6	0	0	819				
5	8	0	88				6,473
5	0	0	1,121				
4	8	0	698				

	Before Settlement.	After Settlement.
	RS.	RS.
† Total assessment ...	3,81,233	4,18,930
Assessment on lands given up	18,396	38,568
	3,62,837	3,80,362
		3,62,837
Increase ...		17,525

9. The Collector will be instructed to report, after personal inspection by himself or by his divisional officers, on the condition of the several irrigation works on which the lands in question were dependent.

10. Ordered that the following despatch be transmitted to the Right Honorable the Secretary of State, and that a copy thereof and of the foregoing Proceedings be forwarded to the Government of India, Revenue and Agricultural Department, with reference to letter from that Department, dated 11th April 1883, No. 418R—88-3.

(Here enter No. 2, dated June 1884.)

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

607A.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) H. E. STOKES,
Secretary to Government.

Exd. W. H. French.

120 Copies.

111

Inw No 1623/84

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 7th May 1884,
Nos. 607, 607A.

No 1752/96

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre.
Madras 3d June 1884

(By order)

[signature]

Ist. Assistant

To The Dy: Director. Party No. II

MAY.

New Settlement Rates.

The statistics relating to the incidence of — in Cuddapah, in its bearing on relinquishments of land, analysed and reviewed, and a despatch embodying the conclusion arrived at by the Government, ordered to be transmitted to the Right Honorable the Secretary of State.

3rd May 1884, No. 880, Public.

112

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

Read—the following :—

Official Memorandum from the Secretary to Government, Revenue department, dated 29th February 1884, No. 101.

Order—dated 3rd May 1884, No. 880, Public.

The attention of heads of departments, to whom G.O., 1st December 1882, No. 1357, was communicated, is specially directed to paragraph 3 of the resolution of the Government of India printed therein at page 8 and concerning investments by public servants.

G.O., 1st Dec. 1882, No. 1357, Rev. dept.
G.O., 22nd Feb. 1884, " 255, do.
G.O., 3rd May 1884, " 879, Pub. dept.

2. The returns, the submission of which is prescribed by the orders noted in the margin, will in future be submitted to, and disposed of in, the Public department.

(True Extract.)

E. F. WEBSTER,
Chief Secretary.

To the Secretary to Government, Revenue department.
" the " " Military department.
" the " " Public Works department.
" the Private Secretary to His Excellency the Governor.
" all Members of the Covenanted Civil Service.
" all Military Officers in civil employ.
" the Board of Revenue.
" the Settlement department.
" the Superintendent, Revenue Survey.
" the Conservator of Forests.
" the Inam Commissioner.
" the Commissioner of Salt Revenue.
" the Superintendent, Government Press.
" the Inspector-General of Police, } with copy of Revenue G.O., 1st Dec. 1882, No. 1357.
" the " " of Jails,
" the " " of Registration,
" the Sanitary Commissioner,

[Annexure

Exd. T. O'Connor.

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ANNEXURE.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper :—

G.O., dated 22nd February 1884, No. 255, Revenue.

Read—the following Proceedings of the Board of Revenue, dated 9th February 1884, Mis. No. 1198 :—

Read—the following letter from H. W. BLISS, Esq., Commissioner of Salt Revenue, on special duty, to the Secretary to the Board of Revenue, dated Madras, 4th February 1884, No. 4 :—

Referring to the Board's Proceedings, No. 139, dated 16th January 1884, I have the honor to forward return of lands, &c., held by me in the prescribed form received on the 31st ultimo.

2. In doing so, I beg respectfully to state that I can find nothing in the rules laid down by the Government of India and the Secretary of State, with respect to the holding of lands and of shares in public companies by Covenanted Civilians, to lead Government to inquire even as to the fact (much less as to the amount) of an officer's investments in companies not holding land for agricultural, mining, or trading purposes. I respectfully venture to think, for instance, that Government are not justified, in the absence of any suspicion or rumour that an officer is addicted to speculation to such an extent as to interfere with the discharge of his public duties, in requiring him to disclose his private affairs by stating what shares he holds in the Bank of Madras or in the South Indian Railway or even in the Bank of England. I am not fortunate enough to have large investments, nor do I object to disclose what I have. It is, therefore, with no personal object that I venture to draw attention to what seems to me an unnecessary and undue inquiry into the private means of officers. If these returns were for the sole information of the Members of Government, it would be a different matter. But, as they are, they constitute, in my humble opinion, an unnecessary publication of the private circumstances of gentlemen in the service, especially when, as was the case last year, the returns are printed and circulated to all the officers subordinate to the Board, in such a way that all the office establishments have access to them.

3. I trust that in making these remarks, and in requesting that they may be laid before Government (I hope with the support of the Board), I shall not be considered to be wanting in respect for the orders of Government.

Resolution—dated 9th February 1884, Mis. No. 1198.

The Board resolve to submit Mr. Bliss' letter and return to Government in anticipation of their general return, for the compilation of which the information required is not yet complete, owing to the statements of some officers having been sent back for revision.

2. In the views expressed by Mr. Bliss the Board entirely concur, and venture to seek a reconsideration by Government of the orders recently promulgated. It is submitted that the requirements of Government in this matter which necessitate the exhibition by each member of the Civil Service of all investments in joint-stock companies go beyond the restrictions imposed by Government in regard to their officers' connection with such companies, and that the inquiry is of a nature to cause an amount of dissatisfaction on the part of the officers affected by it, which is out of proportion to the advantage gained to Government by the information afforded.

3. For these reasons the Board commend Mr. Bliss' letter to the favorable consideration of Government, and trust that the recent orders upon this subject may be modified in such manner as to require the submission only of such a return as may be needed to enable Government to ascertain that their orders are being observed.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Chief Secretary to Government, Public Department, with original letter and enclosure to be returned.
Copy to the Commissioner of Salt Revenue, on special duty.

Order—dated 22nd February 1884, No. 255, Revenue.

Miscellaneous.

There is much force in the objections urged by Mr. Bliss and the Board of Revenue.

2. The following form, intended to elicit information essential with reference to the despatch of the Secretary of State, No. 46, dated 31st May 1862 (printed in G.O., 1st December 1882, No. 1357), will accordingly be substituted for that issued with G.O., 25th April 1883, No. 511 :—

Number.	Name of the Officer.	Official Designation and Station.	Particulars of Land held.					Registered Companies in which Shares are held.			Whether the Right so conferred has been availed of and, if so, to what Extent.	Remarks.
			Where situated, *i.e.,* District and Taluk.	Description of the Land.	Extent in Acres.	Assessment or Quit-rent payable, if any.	Purpose for which the Land was acquired and how actually utilized.	Names of Companies.	Where they carry on Operations.	Whether the Shares convey any Right to acquire Landed Property and, if so, to what Extent.		

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue, with two enclosures.
„ Public Department.
„ Public Works Department.
„ Military Department.

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ORDER—dated 3rd May 1884, No. 879, Public.

Communicated to the undermentioned officers for information and guidance.

(True Extract.)

E. F. WEBSTER,
Chief Secretary.

To W. Logan, Esq., Resident, Travancore and Cochin.
,, R. W. Barlow, Esq., Acting Resident, Travancore and Cochin.
,, H. F. Clogstoun, Esq., Accountant-General.
,, H. B. Grigg, Esq., Director of Public Instruction.
,, Colonel T. K. Guthrie, Inspector-General of Police.
,, Colonel T. E. Tennant, Inspector-General of Jails.
,, Colonel T. Weldon, Chief Presidency Magistrate.
,, Lieutenant-Colonel G. H. Oakes, Acting Cantonment Magistrate, St. Thomas' Mount.
,, Major C. J. Bromhead, Cantonment Magistrate, Poonamallee.
,, Lieutenant-Colonel W. R. Sheffield, Cantonment Magistrate, Cannanore.
,, Lieutenant-Colonel C. D. Baynes, Government Agent, Chepauk.
,, Lieutenant-Colonel W. B. Sherman, British Consular Agent, Pondicherry.
,, Lieutenant-Colonel B. Fischer, British Consular Agent, Karikal.

Inl. No. 1547/84

Govt. of (1884) Madras.

PUBLIC.

Issued

Recd. Encl.

G.O., 3rd May 1884, No. 880.

MAY.

No. 1686/92

Communicated to the Special Assistant Collectors in charge of Parties Nos. IV & VI and to the Dy. Director of Party No. III

(By order)

[signature]

1st Assistant

Deptt. of Reve: Settt. & Agriculture
Madras 27 May 1884

To
The Dy: Director of Reve: Settt: Party No. III

Returns of Lands.

Drawing the attention of heads of departments to the Government of India ruling about returns of lands, &c., and investments by public servants, and directing that such returns should in future be submitted for disposal in the Public department.

8th May 1884, No. 614, Revenue.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 26th March 1884, No. 1124 :—

Read—the following letter from J. LAKSHMIKANTA RAO, Deputy Director of Revenue Settlement, No. V Party, South Arcot, to the Director of Revenue Settlement and Agriculture, dated Cuddalore, 14th December 1883, No. 161-101 ; and endorsement by W. WILSON, Esq., Director of Revenue Settlement and Agriculture, dated Madras, 8th March 1884 :—

As arrangements are being made by the Deputy Superintendent of No. IV Madras Survey for the demarcation and survey of the northern villages of the Chidambaram taluk, called Bhuvanagiri division, I have the honor to bring to your notice the necessity of re-demarcating and surveying on the present system the other villages of that taluk surveyed experimentally in 1853 by Captain Priestly and settled by Mr. Newell in 1861, with a view to their re-settlement being made in 1891 when the full term of the present settlement expires.

2. When talking to Mr. Beaumont, the Deputy Superintendent, he informed me that the question of re-surveying the villages of the said taluk once settled was, with the concurrence of the Collector of the district, mooted by him in 1879, but the Board of Revenue* agreed with the member in charge of settlement that it was unnecessary to disturb the work already done until the full term of the current settlement has expired.

* Proceedings, Mis. No. 3932, dated 12th April 1880.

3. The defects in the experimental survey were fully detailed in the Deputy Superintendent's letter of the 24th July 1879, No. 2136-659, to the Superintendent of Revenue Survey, and this taluk being the first in the Presidency to come under settlement, it differed somewhat in soil-classification from later-settled districts, as it was classified before the present method was matured. It is therefore clear that at the time of re-settlement, both the survey and settlement should be so revised as to place it on a uniform basis with the entire district.

4. As the orders of the Board of Revenue, referred to above, were to the effect that the present work should not be disturbed until the full term of the current settlement had expired and not prohibitive altogether, I venture to moot the question again.

5. Since that time, four years have elapsed, and there remain only eight years to run before the expiration of the term when it is absolutely necessary to undertake the re-settlement, but I beg to submit that this cannot be effected unless and until demarcation and the survey operations on the present system are completed or old survey numbers are substantiated by erecting permanent marks in their proper places. As the Settlement Department has just started to settle the remaining portion of the district, it will take probably 7 or 8 years to complete it ; thus by the close of the settlement operations, they will be ready to re-settle the villages of Chidambaram above referred to.

6. It may perhaps be thought that the commencement of survey operations in the said villages, even in this distant period, is somewhat premature, but it must be remembered that the work needs be done, if not now, a few years hence, and it seems to me that this can be done much better and cheaper while the survey party is available on the spot rather than after it leaves the district. Perhaps the survey will complete their operations a few years before the expiry of the term of the present settlement, but such intervals have inevitably occurred everywhere else.

7. In these circumstances, I beg to recommend that the orders of the Board may be reconsidered and steps taken for conducting the re-demarcation and survey of the Chidambaram villages in question simultaneously with those of the northern, in which the above operations are, I believe, just undertaken.

Endorsement, No. 743-17A.

Submitted to the Board of Revenue, with the suggestion that their Proceedings, No. 3932, dated 12th April 1880, be reconsidered, and that advantage be taken of the presence now in the Chidambaram taluk of a survey party to have the 405 villages that were surveyed by the experimental party in 1853, surveyed again on the present method. The necessity for doing so seems clearly indicated in the correspondence. It is further suggested that the soils of the whole taluk be in due course re-classified by the settlement party now working in South Arcot in five sorts instead of in two as they are now. No change in the assessment of lands now occupied will, of course, be made during the currency of the present settlement.

Resolution—dated 26th March 1884, No. 1124.

Submitted to Government.

2. The Board think that Proceedings of 1880, No. 3932, of 12th April, should be reconsidered, and they accordingly recommend that both of the Director's proposals be acceded to, viz., that all the villages surveyed and classified for soils in 1853, should be again surveyed now and have these soils re-classified, so as to be ready to introduce any necessary changes in 1893 when the present settlement expires.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department.

Copy to the Director of Revenue Settlement and Agriculture.

Order—dated 8th May 1884, No. 614, Revenue.

Miscellaneous.

His Excellency the Governor in Council approves and sanctions the Director's proposals which are concurred in by the Board of Revenue.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Superintendent of Revenue Survey.

Exd. W. H. French.

70 Copies.

11[illegible]

Ins No 1548/84

Govt. of (1884) Madras.

REVENUE.

No 1685/91

Communicated to the Dy. Director of Party No V for information

(By order)
Seappanah
1st Assistant

Depth of Reve: Settl & Agriculture
Madras 27 May 1884

Copy to the Dy Director of Party No III

Issued

Recd. Encl.

G.O., 8th May 1884, No. 614.

MAY.

Re-survey and Classification of Chidambaram Taluk.

Director's proposals regarding —, approved and sanctioned.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 28th April 1884, No. 1428 :—

Read—G.O., dated 18th March 1884, No. 396, Revenue :—

ABSTRACT.—Passing orders on Mr. Garstin's reports regarding revision of Revenue establishments.

Resolution—dated 28th April 1884, No. 1428.

In paragraph 17 of G.O. of 18th March 1884, No. 396, Revenue Department, the Government request the Board to prepare and submit for definite sanction a proposition statement in the usual form showing the changes approved of in the preceding paragraphs of the Government Order and their cost. The Board regret they are at present unable to do this, because there are several points connected with their second Member's scheme for the revision of Revenue establishments, regarding which the orders passed by Government are not sufficiently specific to admit of the proposition statement being compiled. These are noted below and the orders of Government on each are solicited at an early date.

2. *Paragraph 3 of the Government Order.*—The Government approve Mr. Garstin's proposals relative to the number of Revenue Inspectors for each district, but subject to further consideration and report by the Board in regard to the South Arcot, Godávari and Tanjore Districts. The number proposed by Mr. Garstin for South Arcot, though not more than the Board consider needed by the circumstances of that district, may be reduced from 55 to 52. The number proposed for Godávari, 37 (which is the number asked for by the Collector, Mr. Happell), may be raised to 40. The number proposed for Tanjore is what was considered sufficient by the Collector, Mr. Stokes, and by the Board in 1875. They think, therefore, it may stand unaltered. There will thus be no alteration in the total number of Revenue Inspectors proposed for the whole Presidency. The Board trust that the Government will approve this arrangement.

3. *Paragraph 5 of the Government Order.*—In calculating the number of additional Deputy Tahsildars required, the Government have been guided by the principle that these officers are most needed in taluks where there are now none and in taluks of the two highest classes; but in making their calculation of the number required, they have reckoned two second-class taluks twice over. These are Arcot and Ambásamudram, which, though both second-class taluks, have neither any Deputy Tahsildar. Hence these two taluks are included in the total 36 first and second class taluks, as well as in the total 53 taluks without any Deputy Tahsildar. Consequently, unless it was the intention of Government to give two Deputy Tahsildars to each of these two taluks, the total number of additional officers of that grade required is only 87 instead of 89. If, however, there are to be two Deputy Tahsildars in each of these two taluks, one, it is presumed, will be stationed at the taluk cusbah; but the Government Order is silent as to what is to be the station of the second Deputy Tahsildar in each case. It is also presumed that this officer will have the same establishment (costing Rs. 59 a month) as has been sanctioned for other Deputy Tahsildars at outlying stations. If, on the other hand, there is to be only one Deputy Tahsildar in each of these two taluks, then the Board presume he will be stationed at the cusbah, and in that case he will need no additional establishment.

4. In the latter part of the same paragraph (5), the Government specify 8 taluks for which Mr. Garstin has provided no additional Deputy Tahsildars, but they have apparently overlooked the fact that that officer recommended (in paragraphs 11 and 71 of his second report, pages 33 and 44) that the Sub-Magistrates of Tekkali in Ganjam and of Mangalore Town should be transferred to their respective taluk head-quarters as Cusbah Magistrates and their establishments dispensed with. Orders are requested on this proposal.

5. Moreover, when the second Member's report was written, the Mangalore Taluk was a third class, and the Kásaragód Taluk a second class, one. But by G.O. of 12th November 1883, No. 1387, Revenue Department, the latter taluk is now third class and the former second class. The Government, however, have nevertheless now allotted an additional Deputy Tahsildar to Kásaragód because it is a second class taluk, the change of classification having apparently been lost sight of. The Board presume, therefore, that the additional Deputy Tahsildar allotted for Kásaragód should be transferred to Mangalore, in which case Mr. Garstin's proposal to transfer the Town Sub-Magistrate of Mangalore to the Mangalore Taluk Cusbah may be disallowed, the Town Sub-Magistrate and his establishment remaining as at present, and the additional Deputy Tahsildar being posted to the Mangalore Taluk Cusbah.

6. The cost of each Deputy Tahsildar's establishment, as proposed by the Board's second Member, was Rs. 59 against Rs. 54, the cost of the existing establishment. The saving, therefore, alluded to by Government (paragraph 5) as not likely to be realized in respect of six taluks will be Rs. 59 × 6 = Rs. 354 instead of Rs. 324 a month as stated by Government. If, however, the Tekkali Sub-Magistrate's appointment is abolished, as proposed, there will be a saving of Rs. 54 + 15 (for a Shroff) = Rs. 69 per mensem, but if it is retained the second Member's estimate of cost must be increased by Rs. 59 + 15 = Rs. 74 a month or Rs. 888 per annum. In addition to this, if the Mangalore Town Sub-Magistrate is not abolished, a still further increase of cost of Rs. 59 a month will be incurred.

7. The Board presume that in the 87 taluks to which (as shown above) additional Deputy Tahsildars are to be allowed, the pay of the Taluk Sheristadars will be reduced from Rs. 60 to Rs. 50, and that they will be styled in future Taluk Head Accountants and Treasurers. But the Government Order is silent as to the designation of the Taluk Sheristadars in the 65 taluks where no Deputy Tahsildars are allowed, and where the pay of the Taluk Sheristadars has not been reduced. No orders, moreover, have been laid down as to whether these 65 Taluk Sheristadars are to continue to exercise magisterial powers or not.

8. For the Bhímavaram Taluk, Mr. Garstin recommended the appointment of two additional Deputy Tahsildars—one to be located at the cusbah and one at Undi. The Government have disallowed the first half of this proposal, sanctioning only the Deputy Tahsildar at Undi. In this case, too, is the Bhímavaram Taluk Sheristadar to exercise magisterial powers or not?

9. *Paragraphs* 6 *and* 7 *of the Government Order.*—The Government have approved Mr. Garstin's proposals for the Kollegál Taluk; but it is observed that by G.Os. of 15th January 1884, No. 62 A, Revenue Department, and 12th March 1884, No. 354, Revenue Department, the Judicial and Revenue establishments of this taluk have been amalgamated in connection with the late judicial re-organization, by which the pay of the Tahsildar (hereafter to be called Tahsildar-Munsif) is to be raised to Rs. 250 a month, and he will be allowed a Judicial establishment costing Rs. 114 per mensem (as shown in the margin), in addition to the existing Revenue establishment. The increase in the Tahsildar's pay (Rs. 100) as well as the cost of the Judicial establishment (Rs. 114) will have to be debited to Law and Justice. The Board assume, therefore, that they may enter in the proposition statement the Revenue establishment at the scale of salaries proposed by

	RS.		RS.
1 Judicial Head Clerk.	35	2 Amins on Rs. 12 each.	24
2 Clerks on Rs. 15 each.	30		
1 Deputy Nazar ..	25	Total ..	114

Existing Establishment.	RS.	*Establishment proposed by Mr. Garstin and approved by Government.*	RS.
1 Tahsildar	150	1 Tahsildar	150
1 Sheristadar	60	1 Head Accountant and Treasurer	50
1 Revenue Inspector ..	30	1 Revenue Inspector ..	40
1 do. ..	25	2 Revenue Inspectors on Rs. 35 each ..	70
1 do. ..	20	1 Gumastah	30
2 Gumastahs on Rs. 20 each	40	1 do.	25
6 Gumastahs on Rs. 15 each	90	2 Gumastahs on Rs. 22-8-0 each ..	45
1 Shroff	15	2 Gumastahs on Rs. 20 each	40
1 Dufterbund ..	7	2 Gumastahs on Rs. 17-8-0 each ..	35
1 Duffadar	8	1 Gumastah	15
21 Peons on Rs. 6 each.	126	1 Shroff	15
1 Massalchi	5	1 Dufterbund ..	7
1 Sweeper	5	1 Muchi	7
39 Total ..	581	1 Duffadar	8
		21 Peons on Rs. 6 each.	126
		1 Massalchi	5
		1 Sweeper	5
		41 Total ..	673

Mr. Garstin and sanctioned by Governmnet without any regard to the increase of pay and of establishment resulting from the Tahsildar's having judicial duties to perform in future. Orders on this point are requested.

10. Similarly, in Cochin Taluk, the offices of Tahsildar, Sea Customs Superintendent, Sub-Judge and Sub-Registrar have been all amalgamated since Mr. Garstin's proposals regarding it were made, which the Government have now approved of. The cost of the amalgamated offices is as shown in the margin, and amounts to Rs. 676 in all, of which Rs. 150 will be debited to Law and Justice, Rs. 371 to Land Revenue, Rs. 145 to Sea Customs, and Rs. 10 to Registration. As Mr. Garstin's proposals only entailed an increase of cost of Rs. 10 a month on the then existing establishment, the Board conclude that they may be disallowed, as a completely new and better paid Taluk establishment has been already substituted for what existed * before.

	RS.
1 Deputy Collector with powers of Munsif	250
1 Sheristadar, Sub-Magistrate and Sub-Registrar ..	100

For Revenue and Judicial Work.

	RS.		RS.
1 Head Clerk	45	4 Peons on Rs. 7 each.	28
2 Clerks on Rs. 20 each.	40	1 Massalchi	5
3 do. on „ 15 „	45		
1 Attender	8	Total ..	171

For Sea Customs Work.

	RS.		RS.
1 Assistant Superintendent	30	8 Peons on Rs. 6 each ..	48
1 Clerk	25	1 Massalchi and Sweeper.	5
2 Clerks on Rs. 15 each.	30		
1 Weigher	7	Total ..	145

	RS.
Sub-Registrar's establishment	10
Grand Total ..	676

* Existing Establishment.	RS.	Proposed by Second Member and approved by Government.	RS.
1 Tahsildar	150	1 Tahsildar	150
1 Gumastah	20	1 Gumastah	25
2 Gumastahs on Rs. 15 each	30	1 do.	20
		1 do.	15
1 Dufterbund	7	1 Dufterbund	7
6 Peons on Rs. 6 each.	36	6 Peons on Rs. 6 each.	36
1 Massalchi	5	1 Massalchi	5
1 Sweeper	5	1 Sweeper	5
13 Total ..	253	13 Total ..	263

11. For the Núzvíd Deputy Tahsildar's office, Mr. Garstin recommended that two additional Gumastahs on Rs. 20 and 15, respectively, should be appointed. The Government have approved this proposal; but in G.O. of 20th December 1883, No. 1601, Revenue Department, they sanctioned the entertainment of an additional Gumastah on Rs. 15 for this office. The Board therefore presume that this Gumastah is to be considered as one of the two additional hands now sanctioned.

12. The report called for in the last sentence of paragraph 7 was submitted to Government on the 3rd instant.

13. *Paragraph* 8 *of the Government Order.*—The existing and proposed numbers of Taluk Shroffs are noted in the margin. The Government have decided that the pay of all Shroffs on Rs. 15 is to be raised to Rs. 18 a month and of all on Rs. 10 to Rs. 12-8-0. Of the 258 Taluk Shroffs proposed by Mr. Garstin, 151 are on Rs. 15, one on Rs. 13 and 102 on Rs. 10. The remaining four get more than Rs. 15 a month each. The increase of cost under this head estimated by the Government Order will therefore be Rs. 708 instead of Rs. 719 as calculated by Government; but if the proposals regarding the abolition of the Tekkali Sub-Magistrate's office and establishment are negatived, the total increase of cost on account of raising the pay of Shroffs will amount to Rs. 708 + 18 = Rs. 726.

	Existing Number.	Proposed Number.
Shroffs on Rs. 35	1	1
Do. on „ 25	1	1
Do. on „ 20	2	2
Do. on „ 15	151	151
Do. on „ 13	1	1
Do. on „ 10	67	102
Total ...	223	258

14. *Paragraph* 12 *of Government Order.*—This relates to the Account Department in Collectors' offices, but the Government have not passed orders on the second Member's proposal regarding the Cash and Stamp Departments in those offices. It is presumed that the increase in the number of Huzur Shroffs and Gollas proposed by Mr. Garstin have the approval of Government. The pay of Taluk Shroffs having been increased, it is submitted that the pay of Huzur Shroffs on Rs. 15, who stand in the same position as Taluk Shroffs, should also be increased. The existing and proposed numbers of Huzur Shroffs on Rs. 15 are 23 and 27, respectively; and if the

pay is raised to Rs. 18 each, there will be an increase of total cost, on this account, of 27 × 3 = Rs. 81 a month or Rs. 972 per annum.

15. The Government have not passed orders on the second Member's proposal, in paragraph 64 of his first report, regarding the five additional Clerks sanctioned for the Cuddapah Collector's office owing to the prevalence of fever there. It is presumed that Mr. Garstin's proposals have the approval of Government, but specific orders are requested. Nor have the Government passed orders on that officer's proposals for the grant of Wynaad allowance to the Revenue employés in the Wynaad Taluk of Malabar.

16. *Paragraphs* 11 *and* 17 *of the Government Order.*—In paragraph 11 the Government remark that if the district offices be relieved of the work of translating vernacular papers in criminal records sent up to the High Court, and arrangements are made to relieve Collectors of divisional charge altogether, either the Vernacular Head Clerk or the Translator could be dispensed with; but that the offices could not stand the loss of both, and that for the present, at any rate, the Translators should be retained. The Board are doubtful whether they are to understand Government as ordering that the Vernacular Head Clerks on Rs. 70 are to be dispensed with at once. They assume this is not intended. Moreover, in paragraph 17 the Government have deducted Rs. 16,800 from the total increase of cost estimated by the second Member because they have disallowed his proposal to abolish the post of Collectors' Translators; but inasmuch as he proposed to utilize that amount in increasing the pay of Head Clerks and in the appointment of extra Clerks on Rs. 20 each, the disallowance by Government of the proposals of Mr. Garstin results in no saving, seeing that the Translators will remain and must draw their former pay. Hence this deduction must be restored.

17. In G.O., dated 18th October 1883, No. 2384, Financial Department, an additional Gumastah on Rs. 15 has been sanctioned for each ryotwari taluk, the salary and pension of such Clerks forming a charge on Process Service fees. It is assumed that this extra Gumastah is not to affect the number of additional Gumastahs now approved by the Government, and that he is to be regarded as one of the Process Service establishment.

18. *Paragraph* 16 *of Government Order.*—In this paragraph the Government have sanctioned an establishment, costing Rs. 50 a month for Sea Customs work in South Canara. A similar establishment for Malabar, costing Rs. 80 a month, has been sanctioned in G.O., dated 6th July 1883, No. 825, Revenue Department. These establishments are required for the preparation of the statistics of sea-borne trade (*vide* G.O., dated 2nd March 1882, No. 248, Revenue Department, and Board's Proceedings, dated 16th March 1882, No. 786). It is therefore submitted that, under G.O., dated 8th April 1881, No. 616, Revenue Department, these establishments should be debited to "Minor Department—Provincial Statistics," instead of to Sea Customs.

19. The total increase estimated in paragraph 17 of the Government Order will have to be modified with reference to the remarks in the preceding paragraphs if they are concurred in by Government.

20. Lastly, the Government have not passed orders on the second Member's proposals in paragraphs 41 and 46 of his report; but perhaps the matters to which they relate were intended to be dealt with separately.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department.

ORDER—dated 13th May 1884, No. 640, Revenue.

Miscellaneous.

The Government proceed to pass orders on the points raised in the several paragraphs of the Board's Proceedings.

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2. *Paragraph* 2.—In Tanjore, Deputy Tahsildars do Revenue Inspectors' work and this is to be discontinued under paragraph 23 of the G.O., dated 18th March 1884, No. 394. As Mr. Garstin provides only one additional Inspector in Mannárgudi and Nannilam taluks, and none in Negapatam, the first two taluks will be no better officered, and the last will be worse off than at present. In Shiyáli also there is no increase. The Board should provide 48 Inspectors for Tanjore. Their proposals for Godávari and South Arcot are accepted.

3. *Paragraph* 3.—The inclusion of Arcot and Ambásamudram both as second-class taluks and as taluks without Deputy Tahsildars was an error. It is not intended to have two Deputy Tahsildars in those taluks. The Board should frame the statement accordingly.

4. *Paragraph* 4.—The Government did not overlook Mr. Garstin's proposals regarding the Tekkali and Mangalore Sub-Magistrates, but intended to approve his suggestions regarding them. But, as now pointed out by the Board (*paragraph* 5), the Deputy Tahsildar provided for Kásaragód should be transferred to Mangalore, and the Mangalore Town Sub-Magistrate left as he is.

5. *Paragraph* 6.—No orders wanted.

6. *Paragraph* 7.—It is stated in paragraph 5 of the Government Order that in taluks where no additional Deputy Tahsildars are to be appointed, the existing organization shall continue. Taluk Sheristadars are to be continued in such taluks with pay and work, revenue and magisterial, as at present.

7. *Paragraph* 8.—The Cusba Deputy Tahsildar for Bhímavaram having been struck out, the Taluk Sheristadar will be retained and will exercise powers as at present. The Undi Deputy Tahsildar is provided on special grounds.

8. *Paragraphs* 9 *and* 10.—The Board's proposals in these paragraphs are approved, the judicial establishment in Kollegál being entirely outside the revenue cutcherry, while the revised establishment in Cochin is in complete substitution of that previously existing.

9. *Paragraph* 11.—Approved.

10. *Paragraph* 12.—Mr. Garstin intended (as appears from the letter quoted, which will be separately disposed of) that the sub-jail warders should be in addition to the existing staff of peons, and should be provided in the Jails budget. Separate proposition statement on this account will accordingly be called for in the Judicial Department.

11. *Paragraph* 13.—No orders.

12. *Paragraph* 14.—It was the intention of Government to approve Mr. Garstin's proposals regarding the cash and stamp departments of Collectors' offices. But, considering that the Huzur shroffs on Rs. 15 are quite subordinate servants, while the Taluk shroffs on the same rate of pay are practically in independent charge and have greater responsibilities, the Government saw no reason to increase the salaries of the former class when raising those of the latter.

13. *Paragraph* 15.—The Collective Board should report, after consulting the Collectors of Cuddapah, Malabar and the Nílgiris, as to the proposals to allow the Collector of Cuddapah to entertain temporary hands on full pay in the room of men down with fever, and to grant Wynaad allowances to revenue servants in that taluk.

14. *Paragraph* 16.—For the present, both Translators and Vernacular Head Clerks in Collectors' offices should be retained. If permanent arrangements are made for relieving Collectors of divisional charge, one or other of these posts will be abolished.

15. *Paragraph* 17.—It is clearly intended that the work connected with revenue processes shall be done by Mr. Garstin's revised taluk establishments, and therefore the additional gumastas sanctioned in Government Order, Financial Department, dated 18th October 1883, No. 2384, will, on the introduction of Mr. Garstin's increased scale, merge in it.

16. *Paragraph* 18.—It does not appear that the work done by the Sea Customs establishments referred to, in the districts of Malabar and Canara, though perhaps mainly tabulation of trade statistics, differs in any respect from the work done by the outport establishments elsewhere; and the Government, as at present informed, see no reason why the cost should be transferred from "Sea Customs" to "Minor Departments."

17. *Paragraph* 20.—The Board are at liberty to draw up a standing order regarding the receipt and disposal of petitions (paragraph 41 of Mr. Garstin's report); and also to recommend for adoption any cheap and simple plan for multiplying copies (paragraph 40). Mr. Garstin's ideas on the former subject commend themselves to Government, but they apprehend that there will be some difficulty in giving them practical shape.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Judicial Department.
,, the Financial Department.
,, the Educational Department.
,, the Accountant-General.
,, J. H. Garstin, Esq., C.S.I.

Exd. P. L. Pereira.

100 Copies.

Ind No. 1608/84

Govt. of {1884} Madras.

REVENUE.

No. 1764

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter.
Dept. of Rev. Sett. & Agre. }
Madras 4 June 1884 }

(By order)
[signature]
1st. Assistant

To
The Dy: Director of Reve: Sett.
Party No. III

Issued

Recd. *Encl.*

G.O., 13th May 1884, No. 640.

MAY.

Revenue Establishments.

Orders passed on the Board's reference on certain points connected with the revision of — approved in a previous Government Order.

17TH MAY 1884, No. 652, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 27th November 1883, No. 3599 :—

Read—the following G.O., dated 12th October 1883, Mis. No. 4119, Revenue :—

Read—the following note by Mr. CHENTSAL RAO, dated 9th April 1883 :—

Under the existing rules,* irrigation from wells sunk in wet ayacut is not exempted from charge, whether the wells are situated within or beyond ten yards from the work of irrigation under which the land is situated. Supposing there is no water in the tank, and the ryot raises a first crop or second crop by means of water supplied from his *own* well, he has still to pay the wet assessment, or charge for water, as if he had received his water from a Government work. The question of exempting these wells from additional charge was considered by the Board in 1880, but they came to the conclusion that "a great deal of the best land is irrigated partly by wells; the ryots know what they have to pay; the assessment is cheerfully and easily paid, and there is no necessity to sacrifice any revenue." Government were not satisfied that there was any well-founded reason for the distinction between wells in wet and dry lands, but still they thought that there was no necessity for any charge.

* Extract from Minutes of Consultation, dated 30th May 1854, No. 617.

Board's Proceedings, 8th June 1880, No. 785.

G.O., 3rd September 1880, No. 1083.

I think that the question of exempting wells in wet lands is of the greatest importance, for it is in these wet lands that water is nearer the surface and baling is easy, and yet it is in these very lands that their excavation is discouraged. I feel sure that if ryots are allowed to dig wells freely in their wet lands, the wet produce of the country will increase by at least 25 per cent. without the least sacrifice of revenue to Government. By declaring irrigation under wells in wet lands free of charge, I do not apprehend any danger of the ryots abandoning Government sources of irrigation and thus causing a sacrifice of revenue, for, if irrigation by surface flow can be had, no one who is sane would go to the expense of baling water from a well. The expense of baling is considerably more than the water-rate charged for surface flow, and no one would incur a larger expenditure to save a smaller one. It is only when there is no water in the tank that the ryot will bale it from his well, and this can possibly cause no loss, but will, on the contrary, be a source of gain to Government, as the cultivation will secure at least the dry assessment of the land, which, under our rules, has to be remitted when there is no cultivation for want of water.

It is true that wells draw water by percolation from the Government work, but the water contained in the wells cannot be said to be so much water taken away from the tanks, for the wells generally become full during the rainy season, and it is only when they are worked and emptied that the volume of water in the tank suffers to any appreciable extent; but as I have already observed, they are not, and will not be, worked when there is water in the tank, and when there is no water in it nothing can be drawn away by the wells. It is in fact the water that has already gone under the soil that is taken by the well, and if the well does not take it, it is merely wasted. There is, however, one slight danger in exempting wells in wet lands, that is, the ryot

may really use tank water, and say that he has used his own well water, and claim exemption or remission. This danger may be obviated by declaring that no remission of the fixed assessment will be granted so long as there is water in the tank, whether he uses the well water or the tank water. This is but reasonable, as we charge the assessment even if the land were left waste if there was water in the tank. We may even rule that if he raises a crop partly by the use of well water and partly by the use of tank water, he shall pay full rate. I do not think it will be difficult to find out whether tank water has at all been used or not, but if it be considered that an inquiry of that sort would lead to abuse, there is a simple way of meeting the difficulty. We must classify all lands, once for all, as one crop and two crop, and assess them accordingly as they have been hitherto cultivated with one crop or two crops. I know that in some places a second crop is raised, but not every year. In such cases I would assess the land with reference to the number of crops raised within a given period, say ten years. Supposing there is a land on which a second crop has been raised only once within the last ten years, I would add to the first-crop assessment one-tenth of the second-crop charge and fix it as the consolidated assessment for both the crops. If he raised a second crop twice during the last ten years, I would add one-fifth of the second-crop assessment to the first-crop assessment, and after thus compounding assessments declare that the lands should pay the assessment fixed whenever any crop is raised, or there is sufficient water for a crop being raised. Then the ryot need not pay any more assessment, whatever be the number of crops he may raise with or without the aid of his wells. This will not only cause no sacrifice of revenue to Government, will not only encourage the excavation of wells and thereby increase the produce of the country, but will also reduce work immensely. There need be no examination of a second crop, and no calculation of water-rate. My only doubt is whether the assessment can be consolidated in the manner suggested by me in the settled districts before the thirty years period expired without the consent of the ryots. I, however, think that if the composition is made in a fair and liberal spirit, and the advantages fully explained to the ryots, they will readily consent to the measure. Then the system would be very simple. Both in the case of dry and wet there will be one single assessment, and the ryot will be at liberty to dig wells in wet as well as dry lands, and raise any number of crops he may please. The only difference between dry and wet lands will be that, in the case of the latter, no assessment will be charged if no crop is raised for want of water.

Order—dated 12th October 1883, Mis. No. 4119, Revenue.

The suggestions made in the foregoing note commend themselves to the Right Honorable the Governor in Council; but before passing orders on the subject, he desires to have at as early a date as possible an expression of the views of the Director of Revenue Settlement and Agriculture, with the observations of the Board of Revenue thereon.

(True Extract.)

(Signed) E. F. WEBSTER,
Secy. to Govt., Rev. Dept.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

Read—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to the Secretary to Government, Revenue Department (through the Board of Revenue), dated Madras, 9th November 1883, No. 2887-55:—

I have the honor, in reference to G.O., No. 4119, dated 12th October 1883, to submit the following remarks on Mr. P. Chentsal Rao's proposal to exempt from charge irrigation from wells sunk in wet ayacut.

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2. Under present rules such irrigation is charged because the wells are supposed to divert or tap a supply created by Government. The reasonableness of the charge depends entirely upon the proof of diversion, that is to say, on the proof that wells sunk in wet ayacuts diminish the supply stored in a Government work for irrigation by surface flow. If it can be proved that they do, the charge is justifiable; if it cannot, it is unreasonable and should be abandoned. So far the evidence is purely negative—it is neither proved that they do, nor proved that they do not. It is assumed, however, that they do, and on this assumption the charge is made. For this reason dry land irrigated from an ayacut well is charged with tirwajasti or fasaljasti, as the case may be, and a second crop raised on single-crop wet land by the sole aid of an ayacut well is charged with fasaljasti, while no abatement—fasalcummi—of the second-crop charge is made when the second crop on double-crop wet land is raised by the sole aid of such a well.

3. I have learned from Mr. Chentsal Rao that his object in bringing this question forward is more especially to obtain the exemption from second-crop charge of lands classed as single-crop lands when a second crop is raised on them by the sole aid of an ayacut well.

4. The question must be determined by the conclusion that may be arrived at as to the reasonableness or otherwise of the present theory that such wells divert and diminish the supply stored by Government for irrigation by surface flow.

5. The existence of wells in a wet ayacut is *primâ facie* evidence that the ayacut is beyond the capacity of the work for irrigation by surface flow. Such wells are chiefly intended to supplement the deficiency of the surface supply in the second-crop season. Not infrequently at that time the Government work has but a scanty supply, often, indeed, no water at all, and the crop is raised either partially or wholly by the aid of well water. Relief in such cases is certainly equitable, and it remains to consider what relief can be given, and how.

6. Under our settlements all wet lands are classed as single or double cropped. The former include all lands the supply to which of irrigation by surface flow for a single crop—in the first-crop season—is assured in all ordinary years. The latter embrace two kinds of lands—

(1) those to which the supply for a first and second crop is in all ordinary seasons assured. Such lands are not in question here;

(2) those to which the supply for a first crop is ordinarily sure, but to which the supply for a second crop is more or less uncertain, the surface flow being generally more or less supplemented by wells. This uncertainty is differentiated and valued at varying rates, all less than the normal charge for second crop (*i.e.*, half the first-crop charge), and the ryot is allowed to compound for the second-crop charge at these lower rates. Composition is optional, but if it is not accepted, the land is classed as single-crop land, and is subject to the full charge for tirwajasti if water is taken from a Government source. Composition may be made at any time, and, when made, the compounded assessment is payable in all years alike.

7. I do not propose to discuss at length Mr. Chentsal Rao's proposals for the final settlement of the Government demand on such lands, for, as will have appeared from the foregoing remarks, they have been for the most part anticipated by our present mode of settlement. I would, however, point out that by his proposal to fix the second-crop charge merely on consideration of the number of crops raised within a given period of time, he would really tax the wells for the exemption of which he is pleading, and might, by making the additional assessment compulsory, impose a permanent charge for what might have been merely casual irrigation. To meet Mr. Chentsal Rao's demands in full, it would be necessary for Government to abandon the present rule of charging for irrigation from ayacut wells in any circumstances. The rule rests, as I have said, on the assumption that such wells diminish the Government supply for irrigation by surface flow, but so far it is not proved that this is

the fact, and what is not proved should not be assumed. The Government should limit its demand for water for irrigation to what it commands, that is, the surface flow. When that passes beyond its control, it should not be charged for wheresoever it may be found or howsoever it may be used. I think Government might well declare—

(1) that it will make no charge for water for irrigation unless supplied from Government works by surface flow;

(2) that dry lands irrigated solely from ayacut wells shall not be subject to any charge for water, be it tirwajasti or fasaljasti;

(3) that single-crop wet lands shall not be subject to fasaljasti for a second crop raised by the sole aid of an ayacut well;

(4) that in all current and future settlements in the case of lands admitted to composition, that is, in the case of wet lands, the second-crop supply of which is generally more or less dependent on wells, the existence of wells shall be considered only so far as they afford an index to the uncertainty of the Government supply for irrigation by surface flow, that is to say, they should be considered not as a ground for *enhancing* the second-crop charge, but as a reason for *reducing* it. The more numerous the wells are, the lower should be the rate of composition when composition is justifiable.

8. Rules to this effect would make irrigation from ayacut wells absolutely free, and wells in dry lands being already free, all wells in the Presidency would in this way be placed on the same footing and be absolutely free.

Resolution—dated 27th November 1883, No. 3599.

The Director's letter is submitted to Government with reference to the Government Order read above.

2. It is observed that the subject-matter of these papers was very fully discussed three years ago, and the Board, maintaining the views then expressed, are not prepared to recommend any change of policy in dealing with private wells sunk in wet lands, and they would deprecate the re-opening of the questions involved in Mr. Chentsal Rao's proposals.

Board's Proceedings, dated 8th June 1880, No. 785.
G.O., dated 3rd September 1880, No. 1083.

3. The attention of Government is specially invited to paragraphs 12 and 27 of the Board's Proceedings quoted above, which recite the opinions of two Revenue officers of great experience, viz., Mr. J. D. Bourdillon and the late Deputy Collector Stree Baliah; with the views of these officers the Board concur, and are convinced that the rules suggested by the Director would open a wide door to fraud. Moreover, any well made in wet land diminishes *pro tanto* the area available for cultivation, and if the proposed rule were enacted, a great impulse would be given to the construction of such wells, which, supposing a well to be sunk in every acre, might lead eventually to the extrusion from cultivation of some two per cent. of the wet area. Of course, in that event land would not be relinquished, but relinquishments of wet land under existing rules are not so frequent as to render it necessary to provide against them by such means.

4. Again, the Board venture to take exception to the dictum laid down at paragraph 3 of G.O., 3rd September 1880, No. 1083, that the formation of a tank does not create the subsoil supply which the wells tap. The Board believe that in very many cases the supply is thus created, and they have in view, for instance, tanks fed by river channels which often receive a full supply without the aid of local rainfall. It cannot be doubted that the water-level of the neighbouring wells at once rises in consequence with the supply received in such tanks; and inasmuch as the owners of wells so situated derive immediate advantage from the vicinity of the Government

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reservoirs, the Board are unable to see any just reason for exempting such persons from payment for the benefit thus derived, or for relinquishing the considerable revenue resulting from the charges at present made; and being of opinion that the unlimited increase in the number of wells would greatly affect the quantity of water stored in the tanks above them, the Board apprehend that, by diminishing the supply of water required for surface irrigation, these wells would tend to create the very evil which their construction is meant to cure.

5. Lastly, the question seems to be likely to be much affected by Section 11 of the Act (XIX of 1883) recently passed for amending the law relating to loans for agricultural improvements. The section runs as follows :—

"When land is improved with the aid of a loan granted under this Act, the increase in value derived from the improvement shall not be taken into account in revising the assessment of land revenue upon the land; *Provided* as follows :—

"When the improvement consists of the reclamation of waste land *or of the irrigation of land assessed at unirrigated rates*, the increase *may* be so taken into account after the expiration of such period as may be fixed by rules to be framed by the Local Government with the approval of the Governor-General in Council."

Thus in the case of a well dug by means of a Government loan, dry land irrigated under it would be liable to be charged eventually an increased rate of assessment; and it therefore seems to the Board that Mr. Chentsal Rao's proposals conflict so far with the policy of the Government of India as expressed in the enactment referred to.

(True Copies and Extract.)

(Signed) E. GIBSON,
Acting Secretary.

To the Secretary to Government, Revenue Department.
,, the Director of Revenue Settlement and Agriculture.

ORDER—dated 17th May 1884, No. 652, Revenue.

Land Revenue, No. 75.

The question of encouraging well cultivation is one of extreme importance, and considerable advances have from time to time been made in the direction of freeing capital sunk in such improvements from special charge in the shape of assessment on the crops raised. The early correspondence and the development of the system now in force are traced in Board's Proceedings, 8th June 1880, No. 785. The tendency has been towards liberality, both in the interpretation of the principle and in the rules for its practical application; the limit of distance within which well irrigation is to be subject to special charge having been reduced till it is now no more than ten yards. There has always been a considerable body of opinion in favor of still further relaxation of the rules on the subject; and in 1878, the Government went so far as to direct that no distinction should be made between wells sunk in wet and dry lands, and that no charge should be imposed on second crop in wet land matured under well irrigation. This order, however, was not carried into effect in deference to instructions from the Secretary of State, who thought the proposed change of such importance as to require further discussion; and on the Board, in their Proceedings of 8th June 1880, No. 785, submitting recommendations adverse to change, the Government (apparently with hesitation) came to the conclusion that the revision of tank ayacuts would afford all the relief necessary (G.O., 3rd September 1880, No. 1083).

2. The matter is now entirely re-opened in the papers read above. Mr. Chentsal Rao, late Head Sheristadar of the Board of Revenue, and the Director of Revenue Settlement and Agriculture, an officer of great experience, are in favor of abolishing all restrictions remaining on the extension of wells; but the Board deprecate the re-opening of the subject, and would make no change in the rules regarding wells in wet lands.

3. The Right Honorable the Governor in Council observes that of the nine Collectors consulted by the Board from 1877 to 1880, six were in favor of some relaxation of the rules, and only three considered no change necessary. The Board themselves in 1877 (Proceedings, 4th January 1877, No. 24) fully admitted that in years of exceptional scarcity further indulgence is required. They were disposed to suggest that when the supply to a Government work entirely fails, crops in wet lands raised by means of wells should only be charged dry assessment; but they were deterred from doing so by the difficulty of dealing with the case of partial failure of supply to the Government work, and by fear of danger to the revenue, the financial consequences of the measure being unknown.

4. The controversy has hitherto turned on the question how far the supply to the wells is derived from the Government works, and the charge of wet assessment has been justified on the ground that the well water so derived as much belongs to Government as that distributed by surface flow from the Government store. In this point of view there is no distinction to be made between wells in dry land within the prescribed limit of distance from an irrigation work, which derive supply by subsoil percolation from the work itself, and wells in wet lands, which are fed either by such percolation, or by percolation or surface flow from circumjacent lands irrigated from the work. Both classes of wells are on a par and should be treated alike.

5. The Government are of opinion that the opposing theories of the exclusive dependence of the wells upon the Government store of water, and upon subsoil drainage unaffected thereby, are equally wide of the truth; and that the expediency of carrying further the liberal policy of exemption which has been hitherto followed is not a question to be decided upon such considerations. No one doubts that the supply in the wells is affected by the presence of water in a tank above, or on adjacent lands; but on the other hand, the extent to which the level of water in the tank is affected by baling from the wells is probably scarcely appreciable. The chief function of wells in wet lands is to enable the ryots to bring to maturity, after the exhaustion of the tank supply, crops which have been sown and half grown under direct irrigation; or to grow second crops in lands which would yield none if dependent on the tank alone. The situation of wet lands, generally low-lying, is favorable for getting at the subsoil supply, quite independent of the supply stored in the tanks. As pointed out by Mr. Chentsal Rao, no one will incur the expense of baling if irrigation by surface flow can be had. It is noticeable that the ayacut wells are most numerous in the inland districts, where the irrigated lands are for the most part dependent on small tanks which have become in time deteriorated from silt, and where the rainfall is precarious. Mr. Wilson's proposed fourth rule brings this out strongly. His Excellency the Governor in Council is persuaded that in such localities not only does the ryot by means of ayacut wells save his crop, but without them the Government would lose the greater part of its wet revenue. Their effect in saving remission for withered crop is undoubtedly very great.

6. The policy of encouraging such wells can therefore hardly be questioned, and the Government agree with Mr. Chentsal Rao in thinking that there is no danger of concession in the matter being abused. Referring to the Board's objection in paragraph 3, the Government observe that wells will not be sunk in wet lands, and the area available for cultivation thus diminished, unless this pays by increasing the yield of the whole field. The extreme case put in paragraph 5 is not likely to arise, and if it does, there are other remedies more potent than the charge of water-rate. The Government do not view Section 11, Act XIX of 1883, as a bar to concession, or as declaring an obligatory policy.

7. His Excellency the Governor in Council therefore approves the principle which underlies the proposals of Messrs. Chentsal Rao and Wilson, viz., that irrigation from private wells should be free from charge for water, either in the shape of water-rate on crops in dry land irrigated, or of water-rate or wet assessment on crops, whether first or second, raised in wet land. In regard to wet land, it is necessary, in order to prevent fraud and dispute, to rule as proposed by Mr. Chentsal Rao that the concession shall be restricted to cases where no supply whatever is received in the Government work. Also, it is to be understood that the concession which Government are about to

sanction has application only to private wells, and that no change is contemplated as regards wells known as Government wells, or as regards dasabandam wells, which are public sources of irrigation.

8. Mr. Wilson's first rule goes too far, in that it exempts all irrigation by lift, and not merely irrigation from wells; and his fourth rule, though stating a sound principle, is suitable rather as an instruction to settlement officers than as a rule to be embodied in a code of revenue charges. The following rules express the intentions of Government, and if the Board see no technical objection to them, they may be issued at once:—

1. No water-rate shall be charged on dry land irrigated solely from private wells, wherever situated.

2. In wet land, provided the tank or other work receives no supply whatever during the period the crop is on the ground, crops raised under irrigation from private wells shall be charged—

(*a*) In single-crop land, for the first crop, dry rates; for the second crop, nothing.

(*b*) In registered double-crop land, for the first crop, dry rates; for the second crop, half dry rates.

Note.—In such land, if any supply is received during the first crop, but none during the second, the charge will be two-thirds of the total two-crop charge *plus* half dry rate. If the case is reversed, dry rate *plus* one-third of the total two-crop charge.

(*c*) In land where the second-crop charge is compounded, single dry rate.

Note.—In such land, the full compounded rate will be charged, if any supply is received during the year.

9. These rules should be introduced experimentally from next fasli year. The effect should be carefully noted by Collectors under instructions which the Board will issue, and fully discussed in the annual jamabandi reports. The number of new wells constructed in wet lands, or in dry lands within the limit hitherto prescribed, should be reported; and the effect of the wells, old and new, in diminishing remission for shavi (withered crop) should be noticed. The Government observe that the figures given in the Board's Proceedings of 1880, as to the number of ayacut wells and the extent of land affected by them, besides being incomplete, afford no basis for an estimate of the financial effect of the measures now ordered. For the whole of the extent will not be exempt under the new rules; and it is impossible to estimate and set off the amount of remission saved. The expediency of continuing the rules will be considered after they have been in force for three years.

10. These Proceedings will be reported to the Secretary of State with reference to Lord Cranbrook's despatch, 9th January 1879, No. 2 (Revenue).

11. The attention of the Director of Revenue Settlement will be called to the orders regarding the use of vernacular terms in English correspondence.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Public Works Department, Irrigation Branch.
,, M.R.Ry. P. Chentsal-Rao Pantulu Garu.

Exd. A. F. Goodall.

100 Copies.

Inw No 1668/84

Govt. of (1884) Madras.

REVENUE.

9. 1797/100

Issued

Recd. Encl.

ommunicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre.
Madras 7th June 1884

(By order)
Shapavah
1st. Assistant

To The Dy. Director, Party No III

G.O., 17th May 1884, No. 652.

MAY.

Private wells.

Irrigation from.—Prescribing revised rules with respect to the charge of water-rate on — to be introduced experimentally from next fasli for three years, and requesting the Board of Revenue to issue them at once if they see no objection.

Revenue Department
Proceedings of the Madras Government
Read the following

128/82 / Rev

Legislation

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Circular No. 57A.

FROM

T. W. HOLDERNESS, Esq., C.S.,
Under-Secretary to the Government of India,

To

THE SECRETARY TO THE GOVERNMENT OF

Rev. and Agrl. Dept.
Agriculture.

Simla, the 15th May 1884.

SIR,

IN connection with the subject of the establishment of fuel and fodder reserves, dealt with in this Department's Resolution No. 16A., dated 1st March 1883, I am directed to forward, for communication to the local Agricultural Department, the accompanying extracts from the Ajmere Forest Administration Report for 1882-83. They indicate the results obtained up to the present time in Ajmere from enclosed fuel and fodder reserves. It will be observed that receipts are growing while expenses are diminishing, and that there is a fair prospect of these reserves becoming profitable.

I have the honor to be,

SIR,

Your most obedient Servant,

T. W. HOLDERNESS,

Under-Secretary to the Government of India.

Order thereon 4th June 1884 No. 2316

Communicated to the Board of Revenue and the Director of Revenue Settlement & Agriculture.

(True Extract)
(Sd) H. E. Stokes
Secy to Govt.

To
The Board of Revenue
" Director of Revenue Settlement & Agricul

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Extract from a Note by Major F. Bailey, R.E., Conservator of Forests, School Circle, North-Western Provinces, dated 9th March 1883, on the Forests of Ajmere-Merwara (Appendix to the Ajmere Forest Administration Report for 1882-83.)

8. *Village Forests.*—Mr. Saunders, however, thinks that if a special regulation could be enacted so as to give the needful powers, an additional area might be taken up as "Village Forest." This is, I think, a very good suggestion. If it were adopted, the reserved forests would be maintained principally with a view to clothing the hill sides with forest growth, and to the supply of timber; while they would always be available as grass-preserves from which grass could be cut and carried away, and parts of them at any rate would be available for the admission of cattle in years of exceptional difficulty. The village forests would be maintained principally as grazing grounds, but they would also supply a certain amount of wood for the use of the village community; the trees on them must be protected, as they are required in order to afford shade to the cattle. There is no doubt that if it is very desirable to take some measures for the protection of a larger area than it will apparently be possible to take up as reserved forests. The cutting and lopping of trees for charcoal and buffalo fodder is carried on largely in the present waste land tracts, and, as increased areas are brought under conservancy, the value of the wood becomes enhanced, and the temptation to cut it down is increased; so that in the course of time these areas will become denuded of the scanty crop of trees they now bear. I am told that in Merwara the number of cattle has been doubled since the present reserved forests were taken up—*i.e.*, during a period of ten years—and it is probable that a somewhat similar increase will be found in Ajmere. The grazing question, which was a difficult one in 1874, is therefore likely to become more difficult still, for, as the cattle increase and the hills become more denuded of trees, the quality of the pasture deteriorates. To take up a considerable area as village forest and place it under control would undoubtedly impose additional restrictions on the people at the present time, but to do this would ultimately prove to be a great benefit to the districts, for, under a proper system of management, the quality of the pasture may be expected to show a marked improvement, and as soon as this result is achieved a smaller area will be required than is now necessary per head of cattle, and the circumstances of the people will then become easier in this respect. The village forests would be managed by the villagers themselves under the supervision of the Forest Department; the demarcation might be effected as a part of the settlement, as it would not be necessary to enclose the tracts with a continuous fence; some guards or watchmen would be required, and these would be appointed and paid by the village community, who would be entitled to any surplus revenue that these forests may at any time produce. I do not propose that any current account of receipts and expenditure should be kept by Government regarding them, and the only rules that it would be necessary to enforce would be made to regulate the following acts:—

(*a*) The lopping of trees. Certain species of trees, and all trees below a certain size, must be protected.

(*b*) The felling of trees. The maximum number to be felled annually must be fixed, and no tree must be felled without the permission of the lambardar.

(*c*) The lopping or felling of any trees for sale must not be permitted without the express permission of the forest officer and a proportion of the ground must be freed from all lopping and felling.

(*d*) The grazing of cattle. It will be necessary either to divide each Village Forest into three nearly equal portions, with reference to the present quality of the pasture, and to close each portion in succession for one year, grass being allowed to be cut in the closed portion during November and December; or to close the whole area from July to October inclusive, allowing grass to be cut and removed during November and December, and allowing the entry of cattle during the remaining six months of the year. The first named system would probably be the best, while I believe that the second would be the most readily accepted by the people, who, I am informed by Mr. Lowrie, have already begun to treat portions of their waste lands in this manner.

(*e*) The breaking up of land for cultivation. This should only be done on fallow land.

It will be necessary to include some fallow land in the village forests, and this must be provided for in any new regulation which is made. I understand from the Commissioner that a proposal has previously been made to constitute village forests, but that it was not sanctioned by Government. In case, however, the present suggestions are favorably received, I think that Mr. Whiteway should be asked to prepare, as his settlement proceeds, lists of all waste lands which, in his opinion, are available for the formation of reserved forests, and also of all waste and fallow lands which might be constituted as village forests. The areas should in all cases be given, and it can then be decided which of them it will be worth while to take up. In the case of village forests, although a very intricate boundary would be objectionable, there seems no reason why land should be excluded merely because it is near to hamlets or cultivation.

G. C. B. Press, Simla.—No. 128 [illegible] —600

Extract from the Progress Report of the Forest Administration in Ajmere-Merwara for 1882-83.

Free grant of produce.

41. In Ajmere about 5,000 grass permits were issued to the villagers for cutting grass in the Srinagar, Rajosi, Taragarh, and Madar Hill blocks for usual 6 weeks from October to December. The grass was freely cut by the men.

42. In Marwara, the zemindars were allowed to cut grass for a period of 5 months, from 1st November to the end of March. 1,528 tickets were issued to the villagers of Beawar tahsil, and in Dewair and Todgarh the zemindars were permitted to cut grass without tickets. The grass removed from the Merwara Forests by the villagers is estimated at 340,000 head loads, which, at even 6 pies per load, cannot be valued at less than Rs. 10,625.

43. The following table shows the number and quantity of wood supplied to the zemindars for their household and agricultural requirements:—

Name of Tracts.	Wood for house building.			Wood for agricultural requirements.				Fuel.
	Dandas.	Kamris.	Ballis.	Khair.	Dhaukra.	Salar.	Gob.	
Todgarh	8,455	150	70	57	23	8	5	...
Dewair	1,370	...	12	...	...	45	...	...
Chang	1,060	1,742	48	...	32	...	...	...
Borwar and Kotra ...	510	200	6	...	62	...	...	110 maunds.
Biliawas ...	270	...	3	...	...	...	...	...
Total ...	11,665	2,092	139	57	117	53	5	110 maunds.

Besides this, 5,247 dandas, kamris, ballis, bamboos, and salar trees, valued at about Rs. 150, were supplied gratis for the construction of Police chaukis, outposts for the Marwara Battalion guards, schools, and dispensaries.

Yield and working.

44. In Ajmere Rs. 290 were realized from sale proceeds of dry cactus wood, &c., and the grazing and sale of standing grass brought in Rs. 2,463. Of this sum, the grass from the Mohwa Bir and the Nag Pahar, two nazul tracts, contributed Rs. 681 and Rs. 1,225 respectively. A quantity of grass was also sold to the Ajmere Municipality from the Srinagar tract, after the villagers had cut as much as they were able to carry away. Rupees 178 were realized from the sale proceeds of fruit trees and fruits, &c. In Merwara Rs. 107 were realized from sale proceeds of charcoal from the Chang and Todgarh tracts. In the former tract the charcoal was manufactured from the wood cut experimentally from an area of 1 acre. Rupees 110 were realized from the dry wood, &c., removed by Government agency from the Chang, Dilwara Bir, Borwar, and Kotra tracts.

45. The following table shows the forest produce removed by purchasers from the various Merwara forests tracts:—

Tract.	Kamris, Dandas, and Ballis.	Firewood, miscellaneous.	Grass.	Bamboos.	Honey and Wax.	Amount.
	No.	Approximate weight.		No.	Seers.	Rs.
Chang	29,732	3,096	...	...	...	698
Dilwara Bir	...	...	28 cart loads.	...	...	84
Biliawas	...	4,057	...	...	11	295
Ans Pahar	200	4,755	...	...	13	388
Borwar and Kotra	...	21	50 bullock loads.	...	11	21
Todgarh	9,113	1,260	...	6,400	60	659
Dewair	...	...	...	40	36	16
Sheopura and Hattun	900	...	...	...	...	18
Total ...	39,945	13,189	28 cart loads. 50 bullock loads.	6,440	131	2,179

Four thousand eight hundred and seventy-eight cattle are reported to have been admitted in the Todgarh, Biliawas, Dewair, and Sheopura tracts for grazing during the period of 4 months from 1st March to 30th June 1882.

Of this number, 197 were allowed to graze free of any charge, and for the rest Rs. 837 was realized from the villagers, at the rate of annas 2 per cow or bullock and annas 4 per buffalo.

The suggestion contained in paragraph 52 of Mr. Moir's Inspection Report of 1882, proposing to levy grazing dues on Banjara bullocks which carry goods through the Todgarh and Dewair passes, was put in force from April 1882. A man on Rs. 7 per mensem was entertained to collect the fees in the Dewair pass, while the lambardars and patels were ordered to levy the dues in the Kachbali and Pipli Ghâtas of the Todgarh tract. The number of cattle crossing these passes is reported to have been 61,991. Of this number, 139 were camels, sheep, and goats, which were charged 3 pies per head, and the rest were bullocks, buffaloes, donkeys, and ponies, on which a fee at the rate of 1 pie per head was levied. The amount of fees amounted to Rs. 324, giving a net income of Rs. 252.

Financial results.

46. The subjoined table compares the figures of 1882-83 with those of the past four years:—

Main Heads.		1878-79.	1879-80.	1880-81.	1881-82.	1882-83.
		Rs.	Rs.	Rs.	Rs.	Rs.
Receipts		1,241	1,861	1,124	4,066	7,126
Expenditure ...	A. Conservancy and Works ...	5,182	5,280	4,755	5,631	3,689
	B. Establishments ...	8,263	8,470	7,668	8,323	7,595
	Total ...	13,445	13,750	12,423	13,954	11,284
Deficit		12,204	11,889	11,299	9,888	4,158

From the above it will be seen that the results of the year under review have, from a financial point of view, been very satisfactory. The receipts of the year, Rs. 7,126, are the highest figure that has been obtained since the formation of these Reserves, and there seems no reason why now, in a few years to come, our receipts should not equal and perhaps exceed our expenditure, an event which, when we took up these Reserves, was certainly never anticipated. Expenditure has this year decreased considerably, partly because arrangements were not put in force during the year for providing accommodation for the Assistant Conservator.

The principal sources of our income are—

	Rs.
Firewood and charcoal	2,472
Grazing and grass	3,721
Fines and forfeitures	598
Minor produce	242

With the exception of the head "Fines and Forfeitures," there is a considerable increase in other heads over the previous year.

The expenditure under "A. Conservancy and Works" has been Rs. 1,942 less than 1881-82, the principal savings being under the sub-head "Plantations."

The charges under "B. Establishments" amounted to Rs. 7,595 against Rs. 8,323 in the preceding year, the decrease being chiefly under the head "Pay of Superior Officers," there being no Superior Officer here for about three quarters of the year.

G. C. B. Press, Simla.—No. 128 R. & A. D.—16-5-84.—600.

1884.

GOVERNMENT OF INDIA.

REVENUE AND AGRICULTURAL DEPARTMENT.

AGRICULTURE.

To

THE SECRETARY TO THE GOVERNMENT OF

Circular No. 57A.

Dated Simla, the 15th May 1884.

SUBJECT.

Forwards extracts from the Ajmere Forest Administration Report for 1882-83 showing the results obtained from the Ajmere fuel and fodder reserves.

G. C. B. Press, Simla.—No. 128 R. & A. D.—165-84—650.

Gn No 1585/84

No 1419

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 11th June 1884.

(By order)

S. Seshagiri[illegible]
Ist. Assistant

To
The Dy. Director of Rev. Settt.
Party No III

28TH MAY 1884, No. 681, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following extract from the Proceedings of the Government of India in the Revenue and Agricultural Department (Agriculture), dated Simla, 28th April 1884, Circular No. 54A :—

Read—

Government of India Circular, No. 31A, dated 14th May 1883.

Read also—

Letter from the Government of Bombay, No. 4576, dated 16th June 1883.
Letter from the Government of Bengal, No. 421T.R , dated 22nd June 1883.
Letter from the Chief Commissioner, British Burma, No. 1530-86A., dated 29th June 1883.
Letter from the Chief Commissioner, Central Provinces, No. 28., dated 26th July 1883.
Letter from the Government of Madras, No. 4484, dated 10th November 1883.
Letter from the Chief Commissioner, Assam, No. 2134, dated 4th December 1883.
Letter from the Government of Punjab, No. 39, dated 7th February 1884.
Letter to the Government of the North-Western Provinces and Oudh, No. 115, dated 20th February 1884.
Letter from the Government of the North-Western Provinces and Oudh, No. 441, dated 6th March 1884.

Resolution—

In its Circular letter No. 31A. of the 14th May 1883, the Government of India enquired if Local Governments and Administrations would agree to the proposal that the annual reports of the Agricultural Departments be divided into the following heads :—

I.—Organization and maintenance of village records.
II.—Analysis of districts.
III.—System of collection of revenue and rental in precarious tracts.
IV.—Measures of protection, including arboriculture.
V.—Agricultural experiments, including farms.
VI.—Introduction of agricultural improvements.
VII.—Collection of statistics, including traffic registration.

2. On a review of the replies which have been received on the subject (an abstract of which is appended), and in order to meet the suggestions of the Chief Commissioners of British Burma and the Central Provinces, the Government of India now desires that the following modifications may, with the assent of , be made in the headings originally proposed, and that the reports of Agricultural Departments may in future be prepared in accordance therewith :—

I.—Organization and maintenance of village records.
II.—Analysis of districts with reference to security from famine (cf. paragraphs 9 and 10 of Resolution, dated 8th December 1881).
III.—System of collection of revenue and rental in precarious tracts.
IV.—Measures of protection, including—
(1) Fodder reserves and arboriculture.
(2) Extension of communications.
(3) Irrigation.
V.—Agricultural experiments, including farms.
VI.—Cattle-breeding and veterinary establishments.
VII.—Agricultural and fiscal statistics.
VIII.—Trade and trade statistics.

3. The Government of India would observe that the subject of communications would be primarily considered under head II, and that any remarks under head IV (2) would ordinarily be confined to improvements effected, or likely to be effected, in the agricultural condition of a district by communications opened during the year under report.

4. The suggestion made by the Government of the Punjab, quoted in the final paragraph of the appended extract, may be accepted in any case in which the subject for which a heading is provided is not one dealt with by the Agricultural Department.

Order—

Ordered that a copy of this Resolution and its enclosure be forwarded to the Local Governments and Administrations noted in the margin, for information and guidance, and to the Government of Bengal for information.

Madras.	Punjab.
Bombay.	Central Provinces.
North-Western Provinces and Oudh.	British Burma.
	Assam.

(Signed) T. W. HOLDERNESS,
for Secretary to the Government of India.

To the Secretary to the Government of Madras.

ENCLOSURE.

Abstract of replies regarding divisions to be adopted in the Annual Reports of the Agricultural Departments.

In its letter No. 31A., of the 14th May 1883, to Local Governments and Administrations, the Government of India stated that it would be convenient, in collecting information regarding the progress made and work done by Agricultural Departments throughout India, if some uniform arrangement could be observed in the reports of these departments, and in this view it proposed that the annual reports of the Agricultural Departments should be divided into the following heads :—

I.—Organization and maintenance of village records.
II.—Analysis of districts.
III.—System of collection of revenue and rental in precarious tracts.
IV.—Measures of protection, including arboriculture.
V.—Agricultural experiments, including farms.
VI.—Introduction of agricultural improvements.
VII.—Collection of statistics, including traffic registration.

From the replies which have been received it appears that the Governments of Bombay, Madras, Bengal, North-Western Provinces and Oudh, and the Chief Commissioner, Assam, have no objections to offer to the headings proposed by the Government of India, and are prepared to adopt them in the annual reports of their Agricultural Departments.

The Chief Commissioner of British Burma has also no objection to the arrangement proposed, but asks that for his Province the head "Improved means of communication with markets" may be added to the divisions suggested, as the subject is considered to be of very great importance to the agriculture of British Burma.

The Chief Commissioner, Central Provinces, thinks that the headings proposed do not conveniently cover all the subjects which have been made over to the Agricultural Department of those Provinces. It is pointed out that no provision appears to have been made for trade (including fairs), manufactures, mineral resources, cattle-breeding, cattle-disease, and public gardens, unless it is intended that certain of the headings upon which the annual report of the Agricultural Department is to be drawn up should be made sufficiently elastic to include these subjects. Other criticisms which the Chief Commissioner makes are (1) that the headings do not always readily convey their meaning, *e.g.*, "analysis of districts;" (2) that heading No. III seems to express only one among many possible measures for the relief of *normal* distress, and therefore requires extension; and (3) that headings III and IV seem to be logically sub-heads of IV. As regards arboriculture, the Chief Commissioner "is of opinion that a wider signification should be adopted than that generally understood, and that the term should be

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held to include the planting effected by the people on their own lands, and not merely the comparatively unimportant efforts of Government to establish and maintain roadside avenues. While not denying that arboriculture may be one among other protective influences in time of famine, the Chief Commissioner would not be inclined to regard it as of sufficient importance to deserve separate treatment as a measure of protection. But if the Government of India decide to regard it as such, it is clearly the arboriculture of the people, the fruit trees which they plant in their fields, and not the work of Government officials, that should chiefly be looked at. The prevention and treatment of cattle-disease is, on the other hand, a measure of extreme importance in these Provinces, and appears to deserve a separate heading." Under these circumstances, the Chief Commissioner is inclined to prefer the following headings :—

I.—Organization and maintenance of village records.

II.—Examination of the agricultural resources and economic position of the various parts of the Provinces, followed by remarks regarding—

(*a*) the relief of agricultural distress generally wherever existing;
(*b*) special measures of protection against famine.

III.—Cattle-disease.

IV.—Agricultural experiments and improvements (including farms and improvement of breed of cattle).

V.—Arboriculture and public gardens.

VI.—Trade and manufactures, including the collection of trade statistics.

The Government of the Punjab, while accepting the arrangement of subjects proposed, remarks that "the subjects treated under heads IV and VII and in part under head III are not at present dealt with by the Agricultural Department; but it is believed that, as regards these divisions and any other questions which are at present dealt with in the Revenue Administration Report, it will be sufficient to treat them by reference in the Agricultural Department Report, noting where the information required will be found."

ORDER—dated 28th May 1884, No. 681, Revenue.

Miscellaneous.

Communicated to the Director of Revenue Settlement and Agriculture for information and guidance.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
" the Board of Revenue.

Exd. W. H. French.

70 Copies.

In No. 1593/84

Govt. of {1884} Madras.

REVENUE.

No. 1465

...mmunicated to the Officers in charge of Settlement Parties, to ... Agricultural Reporter and to the Inspector of Cattle Diseases.

...pt. of Rev. Sett. & Agre. }
...adras 14th June 1884 }

(By order)

Sleegwah

1st. Assistant

To The Dy: Director Party No. III

Issued

Recd. Encl.

G.O., 28th May 1884, No. 681.

MAY.

Annual Reports of Agricultural Departments.

Government of India resolution regarding divisions to be adopted in the preparation of —, communicated to the Director of Agriculture for information and guidance.

GOVERNMENT OF MADRAS.

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PART VII.

ABSTRACT OF THE INCREASE OR DECREASE IN THE SUSPENSE ACCOUNTS OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR 1884-85.

None.

All Suspense Accounts are treated as Provincial.

GOVERNMENT OF MADRAS.

APPENDIX A.

ACTUAL AND ESTIMATED CAPITAL ACCOUNT OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1884-85.

—	Direct Charges.	Indirect Charges.				GRAND TOTAL.
		Capitalization of Abatement of Land Revenue.	Loss by Exchange on Payments in England.	Leave and Pension Allowances.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System.						
Total actual outlay to end of 1882-83 ...	92,39,974	14,27,327	...	3,52,940	17,80,267	110,20,241
Probable outlay during 1883-84 ...	3,91,951	29,787	833	8,370	38,990	4,30,941
Proposed outlay during 1884-85 ...	4,58,000	25,020	...	11,269	36,289	4,94,289
Total ...	1,00,89,925	14,82,134	833	3,72,579	18,55,546	119,45,471
Kistna Delta System.						
Total actual outlay to end of 1882-83 ...	58,74,768	2,22,819	...	2,33,041	4,55,860	63,30,628
Probable outlay during 1883-84 ...	4,43,131	30,677	3,378	9,921	43,976	4,87,107
Proposed outlay during 1884-85 ...	5,25,000	33,004	...	12,658	45,662	5,70,662
Total ...	68,42,899	2,86,500	3,378	2,55,620	5,45,498	73,88,397
Pennér Anicut System.						
Total actual outlay to end of 1882-83 ...	14,28,862	1,77,098	...	59,199	2,36,297	16,65,159
Probable outlay during 1883-84 ...	...	...	...	...	...	...
Proposed outlay during 1884-85 ...	...	...	...	...	...	...
Total ...	14,28,862	1,77,098	...	59,199	2,36,297	16,65,159
Sangam Anicut System.						
Total actual outlay to end of 1882-83 ...	7,57,154	26,296	...	18,623	44,919	8,02,073
Probable outlay during 1883-84 ...	5,93,470	17,932	...	14,189	32,121	6,25,591
Proposed outlay during 1884-85 ...	6,08,000	1,00,000	...	13,524	1,13,524	7,21,524
Total ...	19,58,624	1,44,228	...	46,336	1,90,564	21,49,188
Cauvery Delta System.						
Total actual outlay to end of 1882-83 ...	10,47,663	60,760	...	41,815	1,02,575	11,50,238
Probable outlay during 1883-84 ...	1,33,558	...	788	2,744	3,532	1,37,090
Proposed outlay during 1884-85 ...	2,66,000	16,250	666	6,408	23,324	2,89,324
Total ...	14,47,221	77,010	1,454	50,967	1,29,431	15,76,652
Srivaikuntham Anicut System.						
Total actual outlay to end of 1882-83 ...	12,38,078	16,177	...	57,880	74,057	13,12,135
Probable outlay during 1883-84 ...	54,240	25,471	...	875	26,346	80,586
Proposed outlay during 1884-85 ...	41,500	14,308	...	780	15,088	56,588
Total ...	13,33,818	55,956	...	59,535	1,15,491	14,49,309
Kurnool Canal.						
Total actual outlay to end of 1882-83 ...	1,76,25,819	...	...	...	...	1,76,25,819
Probable outlay during 1883-84 ...	1,28,000	...	...	...	...	1,28,000
Proposed outlay during 1884-85 ...	...	...	...	...	...	...
Total ...	1,77,53,819	...	...	...	...	177,53,819
Barur Tank Project.						
Total actual outlay to end of 1882-83 ...	1,00,070	6,829	...	2,163	8,992	1,09,062
Probable outlay during 1883-84 ...	11,003	...	...	355	355	4,358
Proposed outlay during 1884-85 ...	85,500	...	...	2,222	2,222	87,722
Total ...	1,96,573	6,829	...	4,740	11,569	2,08,142

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GOVERNMENT OF MADRAS.

APPENDIX B.

ACTUAL AND ESTIMATED REVENUE ACCOUNT OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1884-85.

—	Probable Receipts, 1884-85.			Probable Expenses during 1884-85 including Indirect Charges.	Balance, Surplus or Deficit for 1884-85.	Probable Net Surplus or Deficit for 1883-84.	Actual Net Surplus or Deficit to end of 1882-83.	Probable Net Surplus or Deficit to end of 1884-85.
	Direct Receipts.	Portion of Land Revenue due to Irrigation.	Total.					
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System.	79,000	15,21,920	16,00,920	3,84,838	12,16,082	12,07,327	238,30,805	262,54,214
Kistna Delta System.	50,200	8,85,312	9,35,512	3,04,291	6,31,221	6,40,604	103,73,435	116,45,260
Pennér Anicut System.	200	1,16,000	1,16,200	15,381	1,00,819	99,174	12,09,759	14,09,752
Cauvery Delta System.	8,000	6,45,888	6,53,888	14,086	6,39,802	6,11,397	140,28,384	152,79,583
Srívaikuntham Anicut System.	2,000	87,232	89,232	21,166	68,066	79,679	3,47,082	4,94,827
Kurnool Canal ...	10,000	64,960	74,960	2,26,536	—1,51,576	—1,28,929	— 63,708	— 3,44,213
Total ...	1,49,400	33,21,312	34,70,712	9,66,298	25,04,414	25,09,252	497,25,757	547,39,423

APPENDIX C.

ACTUAL AND ESTIMATED INTEREST ACCOUNT OF THE SYSTEMS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1884-85.

—	Actual Charges for Interest to end of 1882-83.	Probable Charges for Interest for 1883-84.	Probable Charges for Interest for 1884-85.	Total to end of 1884-85.	Net Surplus or Deficit from Appendix B.	Surplus or Deficit after paying Interest to end of 1884-85.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System ...	81,74,910	3,77,138	3,93,837	89,45,885	262,54,214	173,08,329
Kistna do. do. ...	48,19,225	2,43,854	2,63,217	53,26,296	116,45,260	63,18,964
Pennér Anicut do. ...	10,74,532	57,154	57,154	11,88,840	14,09,752	2,20,912
Sangam do. do. ...	25,418	42,155	66,184	1,33,757	...	—1,33,757
Cauvery Delta do. ...	11,60,217	44,578	52,569	12,57,364	152,79,583	140,22,219
Srívaikuntham Anicut System.	5,92,518	50,608	52,523	6,95,649	4,94,827	— 2,00,822
Kurnool Canal	3,52,501	7,07,562	7,10,122	17,70,185	— 3,44,213	— 21,14,398
Barur Tank Project	...	4,223	6,153	10,376	...	— 10,376
Total ...	1,61,99,321	15,27,272	16,01,759	193,28,352	547,39,423	354,11,071

GOVERNMENT OF MADRAS.

APPENDIX E.

MEMORANDUM OF WATER AND NAVIGATION RATES IN FORCE IN CANALS OF THE SEVERAL IRRIGATION SYSTEMS IN THE MADRAS PRESIDENCY.

—	Per Acre irrigated.					
	Flow.			Lift.		
WATER-RATES.	Rs.	A.	P.	Rs.	A.	P.
GODAVARI AND KISTNA DELTA SYSTEMS.						
Single wet crop	4	0	0	3	0	0
Second wet crop on irrigated lands	4	0	0	3	0	0
If compounded for two crops for a term not less than five years	6	8	0	4	14	0
Single dry crop	2	0	0	1	8	0
Second dry crop on irrigated land (if not compounded)	2	0	0	1	8	0
Sugar-cane, betel plantations and other garden produce remaining on the ground for the time of two crops.	8	0	0	6	0	0
Do. if compounded for not less than five years	6	8	0	4	14	0
Dry crop on land for which irrigation has never been supplied or, having been once supplied, has been since discontinued.	2	0	0	1	8	0
KURNOOL CANAL.						
Single wet crop	4	0	0	3	0	0
Second wet crop on irrigated land	3	0	0	2	4	0
If compounded for two crops for a term of not less than five years	6	0	0	4	8	0
Sugar-cane, betel gardens and other garden produce remaining on the ground for the time of two crops	6	0	0	4	8	0
Single dry crop	1	0	0	0	12	0
Second dry crop on irrigated land (if not compounded)	1	0	0	0	12	0
Dry crop on land for which irrigation has never been supplied, or if supplied, discontinued.	1	0	0	0	12	0
Garden crops (Class 2 of Madras Irrigation and Canal Company's rules)	3	0	0	2	4	0

N.B.—A reduction of the above rates at 50 per cent. for the first five years and 25 per cent. for the second five years will be made in the case of lands which have not been wet cultivated within the last ten years.

2. If blocks of 50 acres and upwards of unoccupied waste lands are taken up for irrigated cultivation, water will be supplied, without restriction as to crops, free of charge for five years, and at half rates for another five years.

Water-rates are not separately levied for other irrigation systems.

Navigation Rates on the Godavari, Kistna, Buckingham and Kurnool Canals.

	Rs.	A.	P.
License Fees—Cargo Boats, per ton of 50 cubic feet	2	8	0
Do. Passenger Boats, A Class do. do.	5	0	0
Do. do. do. B do. do. do.	3	0	0
Do. Budgerows C do. do. do.	5	0	0
Do. do. do. D do. do. do.	3	0	0
Do. Steamers, per ton	5	0	0
Do. Private Boats not carrying goods or passengers per boat per annum ...	12	0	0
Do. Pleasure Boats do. do. do. ...	1	0	0
Tolls—Rafts, timber, per 100 square feet	0	8	0
Do. do. bamboo, do. do.	0	4	0
Do. Cargo and Passenger boats, per ton of 50 cubic feet for six weeks	0	8	0
Steamers do. do.	1	0	0
Private boats not carrying goods or passengers, per boat	3	0	0

GOVERNMENT OF MADRAS.

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SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation.							
		GODAVARI DELTA SYSTEM.							
		Eastern Section.							
1	(2.) Main Canals and Branches.	Cocanada Canal.	I. Navigation.	Quarters for Lock establishment.	4,830	376	,3000	1,504	
	(3.) Distributaries.	Ditto ...	L. Earthwork.	Minor channels ...	13,853	12,265	1,060	208	1,712
2	(2.) Main Canals and Branches.	Sámalkót Canal.	I. Navigation.	Quarters for Lock establishment.	3,300	422	2,000	878	
	(3.) Distributaries.	Ditto ...	B. Land ..	Compensation for land.	4,080	2,009	200	1,371	
		Ditto ...	C. Works.	Head sluice, &c.	17,302	13,332	...	1,969	4,218
3	(2.) Main Canals and Branches.	Bank Canal.	B. Land ...	Compensation for land.	7,550	822	2,330	1,728	
	Ditto ...	Ditto ...	F. (1) Other Cross Drainage Works.	Under tunnel to Injeram drain.	5,600	540	3,440	1,500	
			...	Minor drainage works in extension.	3,000	..	...	3,000	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishments (5 locks).	4,300	175	2,000	2,125	
	Ditto ...	Ditto ...	Ditto ...	Lock at Tallarevu	27,800	6,500	20,000	1,300	
	(3.) Distributaries.	Ditto ...	B. Land.	Compensation for land.	18,000	...	...	800	
	Ditto ...	Ditto ...	C. Works.	Head sluices ...	11,310	...	400	1,710	
	Ditto ...	Ditto ...	L. Earthwork.	Earthwork ...	4,000	...	...	2,000	14,163
4	(2.) Main Canals and Branches.	Mundapeta Canal.	I. Navigation.	Quarters for Lock establishment.	2,080	...	1,040	1,040	
	(3.) Distributaries.	Ditto ..	B. Land...	Compensation for land.	3,290	1,434	100	566	
	Ditto ...	Ditto ...	C. Works.	Head sluices, &c.	10,784	4,239	1,500	3,894	
	Ditto ...	Ditto ...	L. Earthwork.	Minor channels ...	8,396	7,296	...	1,100	6,600
5	(2.) Main Canals and Branches.	Coringa Canal.	F. (1) Other Cross Drainage Works.	Inlets	1,300	...	...	1,300	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishment.	3,660	...	1,220	2,440	
	Ditto ...	Ditto ...	O. Miscellaneous.	Cattle crossings ...	1,200	...	...	1,200	
	(3). Distributaries.	Ditto ...	C. Works.	Head sluices, &c.	18,989	12,177	900	2,686	
	Ditto ...	Ditto ...	L. Earthwork.	Earthworks ...	7,731	5,976	93	1,000	8,626

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay: To end of 1882-83.	Outlay: Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
				N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.	Rs.	Rs.	Rs.	Rs.	Rs.
				51. Irrigation and Navigation—continued.					
				GODAVARI DELTA SYSTEM—*continued.*					
				Eastern Section—continued.					
6	(2). Main Canals and Branches.	Injeram Canal.	I. Navigation.	Quarters for Lock establishment.	1,040	...	...	1,040	
	(3.) Distributaries.	Ditto ...	C. Works.	Head sluices, &c.	8,670	2,321	800	2,500	
	Ditto ...	Ditto ...	L. Earthwork.	Earthwork ...	8,318	4,618	...	2,200	5,740
7	(4.) Drainage and Protective Works.	Toolia Bhaga Drain.	B. Land...	Compensation for land.	12,368	9,778	90	2,500	
	Ditto ...	Ditto ...	C. Works.	Masonry works ...	17,764	10,550	1,500	3,500	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements ...	1,18,504	99,462	2,500	1[illegible],500	16,500
8	Ditto ...	Biccavole Drain.	C. Works.	Masonry works ...	9,170	5,967	1,000	1,400	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements ...	58,700	47,061	...	5,500	6,900
9	Ditto ...	Taki Drain.	B. Land...	Compensation for land.	12,897	5,103	386	5,541	
	Ditto ...	Ditto ...	C. Works.	Masonry works ...	15,089	7,489	...	5,000	
	Ditto ...	Ditto ...	L. Earthwork.	Main and minor drains.	2,16,289	1,76,639	1,500	10,000	
									20,541
				TOTAL, EASTERN SECTION.	...	...	...	...	85,000
				Central Section.					
10	(1.) Head Works.	...	K. Buildings.	Rest house at Razole on Gannaram Canal.	2,500	...	...	2,500	
	Ditto ...	...	C. Works.	Under-sluice improvements.	6,300	...	3,300	3,000	5,500
11	(2.) Main Canals and Branches.	Main Canal.	L. Earthwork.	Improvements to Main Canal.	39,000	263	1,450	5,000	5,000
12	Ditto ...	Gannaram Canal.	B. Land...	Compensation for land.	2,310	...	500	1,000	
	Ditto ...	Ditto ...	F. R. and Hill Torrent Works.	Gannaram aqueduct improvements.	21,700	3,995	7,700	5,000	
	Ditto ...	Ditto ...	H. Escapes.	Rámachandrapuram surplus weir	5,270	...	...	3,000	
	Ditto ...	Ditto ...	Ditto ...	Bellampudi surplus weir.	4,400	375	3,000	1,000	
	Ditto ...	Ditto ...	I. Navigation.	Fender pile foot bridge at Rámachandrapuram surplus weir.	390		...	390	
	Ditto ...	Ditto ...	Ditto ...	Rámachandrapuram lock.	18,160	712		7,000	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay: To end of 1882-83.	Outlay: Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	Rs.
	N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.								
	51. Irrigation and Navigation—continued.								
	GODAVARI DELTA SYSTEM—*continued.*								
	Central Section—continued.								
	(2) Main Canals and Branches.	Gannaram Canal.	I. Navigation.	Fender pile foot bridge at Bellampudi Luchswaram.	350	...	...	350	
	Ditto ...	Ditto ...	Ditto	Mondepulanka Lock.	21,200	...	9,000	12,000	
	Ditto ...	Ditto ...	Ditto	Mondepulanka Lock weir.	5,500	...	4,000	2,500	
	Ditto ...	Ditto ...	Ditto	Sivakondu Lock.	19,660	...	...	7,000	
	Ditto ...	Ditto ...	Ditto	Do. Lock weir.	2,750	...	...	2,500	
	Ditto ...	Ditto ...	Ditto	Quarters for Lock establishment.	5,020	...	...	2,260	
	Ditto ...	Ditto ...	L. Earthwork.	Earthwork improvements to the canal.	1,15,600	11,975	21,130	19,000	
	(3) Distributaries.	Ditto ...	C. Works.	Masonry works.	16,350	...	1,600	3,000	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements to various channels.	5,000	...	...	2,000	68,000
13	(2) Main Canals and Branches.	Bank Canal.	B. Land.	Compensation for land.	900	...	150	100	
	Ditto ...	Ditto ...	F. R. and Hill Torrent Works.	Virdha Gowtami drain under tunnel.	9,680	...	6,000	3,680	
	Ditto ...	Ditto ...	F. Other Cross Drainage Works.	Inlets	5,010	...	1,000	1,000	
	Ditto ...	Ditto ...	I. Navigation.	Lolla Lock ...	17,550	1,025	7,500	7,000	
	Ditto ...	Ditto ...	Ditto ...	Quarters for Lock establishment.	2,940	...	...	360	12,140
14	Ditto ...	Amalapur Canal.	Ditto ...	Chintalapudi Lock	18,250	...	...	7,000	
	Ditto ...	Ditto ...	Ditto ...	Chintalapudi Lock weir.	2,790	...	...	2,500	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements to the canal.	87,150	...	15,000	30,000	
	(3.) Distributaries.	Ditto ...	C. Works.	Masonry works ...	8,820	...	...	3,000	42,500
15	(2.) Main Canals and Branches.	Bendamur Lunka Canal	B. Land...	Compensation for land.	690	...	...	100	
	Ditto ...	Ditto ...	I. Navigation.	Indupalli Lock ...	20,170	...	...	8,000	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay: To e[illegible]f 188[illegible]3.	Outlay: Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		GODAVARI DELTA SYSTEM—*continued.*							
		Central Section.—continued.							
	(2) Main Canals and Branches.	Bendamur Lunka Canal	I. Navigation.	Indupalli Lock weir improvements.	1,300	...	...	1,300	
	Ditto ...	Ditto ...	Ditto ...	Quarters for Lock establishment at Indupalli.	860	...	...	860	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements to the canal.	9,000	...	...	2,000	
	(3.) Distributaries.	Ditto ...	C. Works.	Masonry works.	3,950	...	...	2,000	
16	(4.) Drainages and Protective Works.	Gorinkala Drain.	L. Earthwork.	Gorinkala drain improvements.	30,433	1,036	7,170	10,000	14,260
	Ditto ...	Lower Cowsika Drain.	Ditto.	Lower Cowsika drain improvements.	50,600	224	17,570	17,600	
	Ditto ...	Kunaram Drain.	Ditto.	Improvements ...	14,000	..	5,000	5,000	
									32,600
				Total, Central Section.	...	...	...	...	1,80,000
				Western Section.					
17	(2) Main Canals and Branches.	Main Canal.	B. Land...	Compensation for land.	2,000	1,308	150	100	
18	Ditto ...	Kakaraparu Canal.	Ditto ...	Compensation for land.	5,000	2,618	100	100	100
19	Ditto ...	Gostanaddi and Velpur Canal.	Ditto ..	Compensation for the improvements of Gostanaddi bends.	1,200	...	500	700	100
	Ditto ...	Ditto ...	Ditto ...	Compensation for land.	9,000	4,413	100	800	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishment.	1,720	463	500	757	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements to Gostanaddi bends.	4,260	...	450	2,000	
	(3.) Distributaries.	Ditto ...	B. Land...	Compensation for land.	1,290	...	500	790	
	Ditto ...	Ditto ...	C. Works.	Minor masonries.	17,662	9,501	900	1,000	
	Ditto ...	Ditto ...	L. Earthworks.	Minor channels.	5,266	2,748	600	500	
	(2) Main Canals and Branches.	Velpur Canal extension.	B. Land...	Compensation for land.	2,900	...	400	2,500	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		GODAVARI DELTA SYSTEM—*continued.*							
		Western Section—continued.							
	(2) Main Canals and Branches.	Velpur Canal extensions.	(1) F. Other Cross Drainage Works.	Gunupudi Drain inlet.	670	...	300	370	
	Ditto ...	Ditto ...	Ditto ...	Bhimavaram Drain aqueduct.	2,430	..	700	1,730	
	Ditto ...	Ditto ...	G. Bridges.	Vissakoder bridge	8,000	...	4,000	4,000	
	Ditto ...	Ditto ...	I. Navigation.	Bhimavaram lock.	24,500	...	...	10,253	
	Ditto ...	Ditto ...	Ditto.	Quarters for Lock establishment.	1,720	...	500	1,000	
	Ditto ...	Ditto ...	L. Earthworks.	Extension of canal from 36 miles, 30 chains to Yenamudurru drain.	17,314	2,914	8,500	5,000	
	(3) Distributaries.	Ditto ...	C. Works.	Minor masonry works.	2,570	1,028	600	942	32,342
20	(2) Main Canals and Branches.	Bank Canal.	B. Land...	Compensation for land.	4,420	3,788	200	100	
	Ditto ...	Ditto ...	H. Escapes.	Surplus weir at Nakkala head.	3,500	...	1,000	2,500	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishment.	2,580	...	...	2,000	
	(3) Distributaries.	Ditto ...	B. Land...	Compensation for land.	450	...	...	150	
	Ditto ...	Ditto ...	C. Works.	Minor masonries.	7,448	3,748	1,000	2,000	
	Ditto ...	Ditto ...	L. Earthwork.	Minor channels...	8,926	1,661	3,000	3,000	9,750
21	(3) Main Canals and Branches.	Narsápur Canal.	B. Land...	Compensation for land.	2,000	1,242	100	100	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishment.	8,000	2,250	3,400	2,250	2,350
22	Ditto ...	Ellore Canal.	B. Land...	Compensation for land.	2,400	907	50	50	
	Ditto ..	Ditto ...	F. R. and Hill Torrent Works.	Improvements to under tunnels.	4,140	78	2,000	2,000	
	Ditto ...	Ditto ...	H. Escapes.	Fitting with shutters and gearing to escapes 1, 2, 3 and 4.	3,360	...	900	2,460	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishment.	2,260	558	700	1,002	
	(3) Distributaries.	Ditto ...	B. Land.	Compensation mid level channel.	4,500	3,804	10	10	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		GODAVARI DELTA SYSTEM—*continued.*							
		Western Section—continued.							
	(3) Distributaries.	Ellore Canal.	B. Land ...	Compensation low level channel.	1,200	939	10	10	
	(4) Drainages and Protective Works.	Ditto ...	Ditto	Drains from 9½ miles mid level channel.	2,000	1,053	10	10	
	Ditto ...	Ditto ...	Ditto	Pandicodu drain.	2,000	1,335	10	10	
	Ditto ...	Ditto ...	Ditto	Drainage diversion.	500	120	10	10	5,562
23	(2) Main Canals and Branches.	Attili Canal.	Ditto	Compensation for land.	3,000	2,090	50	20	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishment.	2,080	...	450	1,630	1,650
24	Ditto ...	Junction Canal.	Ditto	Quarters for Lock establishment.	1,400	...	650	750	
	Ditto ..	Ditto ...	B. Land...	Compensation for land.	450	248	50	50	800
25	Ditto ...	Venkiah and Weyeru Canal.	I. Navigation.	Quarters for Lock establishment.	4,160	...	1,400	2,760	
	(3) Distributaries.	Ditto ...	B. Land...	Compensation for land.	500	110	100	100	
	Ditto ...	Ditto ...	C. Works.	Minor masonry works.	18,780	4,654	1,000	3,400	
	Ditto ...	Ditto ...	L. Earth-works.	Minor channels ..	4,434	2,201	1,000	1,150	7,4
26	(2) Main Canals and Branches.	Undi Canal.	B. Land ..	Compensation for land.	1,800	1,521	100	100	
	Ditto ...	Ditto ...	I. Navigation.	Quarters for Lock establishment.	1,900	350	900	650	
	(3) Distributaries.	Ditto ...	B. Land ..	Compensation for land.	1,350	786	200	200	
	Ditto ...	Ditto ...	C. Works.	Minor masonries.	30,216	9,850	800	6,000	
	Ditto ...	Ditto ...	L. Earth-work.	Do. channels ..	34,123	17,534	2,000	6,000	
	(4) Drainages and Protective Works.	Ditto ...	C. Works.	Do. masonries.	6,000	...	500	2,000	
	Ditto ...	Ditto ...	L. Earth-work.	Do. Drains ...	2,950	...	500	2,000	16,950
27	Ditto ...	Nakkala Drain.	B. Land.	Compensation for land.	400	..	100	300	
	Ditto ...	Ditto ...	C. Works.	Outfall sluice ...	22,300	...	9,100	12,500	12,800
28	Ditto ...	Yennamadurn Drain.	Ditto ...	Inlet	13,855	10,306	500	3,140	3,140
29	Ditto ...	Gonter Drain.	L. Earth-work.	Improvements to Basvaraju Codu.	5,116	...	400	4,700	4,700

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GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1882-83.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		GODAVARI DELTA SYSTEM—*continued.*							
		Western Section—continued.							
30	(4.) Drainages and Protective Works.	Baggeswaram Drain.	B. Land...	Compensation for land.	650	140	40	50	
	Ditto ...	Ditto ...	L. Earth-works.	Improvements to lower portions.	9,600	...	9,000	600	650
31	Ditto ...	Kaza Drain.	B. Land...	Compensation for land.	200	...	30	50	50
32	Ditto ...	Ruddraya Codu Drain.	L. Earth-work.	Improvements to 2 miles.	3,000	...	300	2,700	2,700
33	Ditto ...	Minor Drain	Do. ...	Irlokodu improvements.	9,000	...	500	3,946	3,946
				TOTAL, WESTERN SECTION ...	...	...	...	...	1,05,000
				TOTAL, GODAVARI DELTA SYSTEM.	...	...	...	...	3,70,000
		KISTNA DELTA SYSTEM.							
		Eastern Section.							
34	(2.) Main Canals and Branches.	Ryves Canal.	L. Earth-work.	Excavation of canal from junction of new cut to Pulleru.	99,500	60,690	16,000	11,500	
	Ditto ...	Ditto ...	O. Miscellaneous.	Six cattle crossings.	1,795	...	...	500	12,000
35	(1.) Head Works.	Head Works.	C. Works.	Anicut under sluices.	12,936	...	...	9,000	9,000
36	(2.) Main Canals and Branches.	Masulipatam Canal.	L. Earth-work.	Canal improvements.	1,74,660	...	...	20,000	20,000
37	Ditto ...	Ellore Canal.	F. R. and Hill Torrent Works.	Kesarapalli aqueduct.	40,500	8,354	29,026	2,000	
	Ditto ...	Ditto ...	Ditto ...	Ampapuram outlet.	1,235	...	...	535	
	Ditto ...	Ditto ...	Ditto ...	Do. Inlet ...	1,280	...	...	780	
	Ditto ...	Ditto ...	Ditto ...	Pedapadu outlet.	2,765	...	...	1,765	
	Ditto ...	Ditto ...	Ditto ...	West Tammileru aqueduct.	13,000	...	...	10,000	
	Ditto ...	Ditto ...	Ditto ...	East Tammileru surplus works.	17,230	...	...	4,000	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		KISTNA DELTA SYSTEM—*continued.*							
		Eastern Section—continued.							
	(2) Main Canals and Branches.	Ellore Canal.	L. Earth-work.	Canal improvements.	29,640	...	...	3,605	
	(3.) Distributaries.	Ditto ...	B. Land...	Mupperu channel compensation for land.	1,370	...	...	1,370	
	Ditto ...	Ditto ...	C. Works.	Mupperu head sluice.	1,000	...	...	1,000	
	Ditto ...	Ditto ...	L. Earth-work.	Mupperu channel.	4,320	...	...	1,000	
	Ditto ..	Ditto ...	Ditto ...	Madapalli channel.	5,320	...	...	1,000	
	Ditto ...	Ditto ..	B. Land...	Compensation for land.	1,410	...	...	1,410	
	Ditto ...	Ditto ...	C. Works.	Head sluice ...	500	...	...	500	
	Ditto ..	Ditto ...	Ditto ...	2·5 fall ...	810	...	...	810	
	Ditto ...	Ditto ...	Ditto ...	3·40 fall ...	1,320	...	...	725	
	(4.) Drainages and Protective Works.	Ditto ...	L. Earth-work.	West Taminileru drain.	2,500	...	...	2,500	
	Ditto ...	Ditto ...	Ditto ...	Pedapad drain ...	6,780	...	...	3,000	36,000
38	(2.) Main Canals and Branches.	Bank Canal.	B. Land.	Compensation for land.	10,000	...	2,000	4,036	
	Ditto ...	Ditto ...	D. Regulators.	Head sluice ...	6,940	...	...	2,964	7,000
39	(4) Drainages and Protective Works.	Uppulur Drain.	B. Land.	Compensation for land.	1,028	...	500	520	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation ...	8,930	...	10	6,430	6,950
40	Ditto ..	Lazzabanda Drain.	B. Land.	Compensation for land.	10,000	...	1,500	3,072	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation ...	59,843	...	2,000	14,978	18,050
				TOTAL, EASTERN SECTION ...	...	...	...	...	1,09,000
		Gudiváda Division.							
41	(2.) Main Canals and Branches.	Pulleru Canal.	G. Bridges.	Bridge over junction canal.	7,650	...	...	1,500	
	Ditto ...	Ditto ...	L. Earth-work.	Pulleru Main canal.	16,000	...	...	3,000	
	Ditto ...	Ditto ...	C. Works.	11 masonry works.	22,740	...	...	3,000	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		KISTNA DELTA SYSTEM—*continued.*							
		Gudiváda Division—continued.							
	(3.) Distributaries.	Pulleru Canal	L. Earthwork.	Gudiváda channel.	16,020	...	4,000	7,500	
	Ditto ...	Ditto ...	B. Land.	Do. do. ...	2,760	...	...	500	
	Ditto ...	Ditto ...	C. Works.	Do. head sluice.	2,720	...	400	1,020	
	Ditto ...	Ditto ...	Ditto ...	Gudiváda bridge at 9th mile.	2,600	...	300	800	
	Ditto ...	Ditto ...	Ditto ...	Gudiváda channel regulator bridge at 9th mile.	2,140	...	300	940	
	Ditto ...	Ditto ...	Ditto ...	Palakodu head sluice.	900	...	350	300	
	Ditto ...	Ditto ...	Ditto ...	Chittram channel head sluice.	900	...	350	300	
	Ditto ...	Ditto ...	Ditto ...	Fixing screw gearing shutters to Kalidindi channel head sluice.	680	...	...	600	
	Ditto ...	Ditto ...	L. Earthwork.	Chevurkodu ...	57,585	...	...	16,000	35,460
42	(2) Main Canals and Branches.	Polraz Canal.	I. Navigation.	Raising banks of Polraz canal.	3,564	...	500	3,064	
	Ditto ...	Ditto ...	L. Earthwork.	Improving and widening.	18,222	...	7,000	3,000	
	Ditto ...	Ditto ...	D. Regulators.	Fixing screw gearing shutters to Polraz canal head sluice.	2,305	...	...	1,300	
	Ditto ...	Ditto ...	B. Land.	Land compensation	2,400	...	...	500	
	Ditto ...	Ditto ...	I. Navigation.	Lock at 16th mile.	18,450	...	5,000	12,000	
	Ditto ...	Ditto ...	E. Falls and Weirs.	Supply weir at 16th mile.	2,935	...	400	2,130	
	(3) Distributaries.	Ditto ...	C. Works.	Minor sluices ...	5,000	...	...	4,000	
	Ditto ...	Ditto ..	L. Earthwork.	Ramavaram channel.	4,047	...	3,000	1,047	
	Ditto ...	Ditto ...	B. Land.	Do. do. ...	695	...	...	195	
	Ditto ...	Ditto ...	C. Works.	Do. head sluice.	700	...	...	400	
	Ditto ...	Ditto ...	L. Earthwork.	Thandivada channel.	2,544	...	500	1,544	
	Ditto ...	Ditto ...	B. Land.	Do. do. ...	368	...	150	100	
	Ditto ...	Ditto ...	C. Works.	Do. head sluice.	500	...	...	500	29,780
43	Ditto ...	Ryves' Canal.	B. Land...	D[illegible]ad channel...	3,385	...	...	500	
	Ditto ...	Ditto ...	L. Earthwork.	Do. ...	17,150	...	...	5,000	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1883-84—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued. 51. Irrigation and Navigation—continued. KISTNA DELTA SYSTEM—*continued.* *Gudiváda Division*—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
	(3) Distributaries.	Ryves' Canal	C. Works.	Head sluice ...	3,970	...	...	2,900	
44	(2.) Main Canals and Branches.	Bantumilli Canal.	I. Navigation.	Head lock ...	2,342	...	2,000	342	8,400
	Ditto ...	Ditto ...	Ditto ...	Head sluice improvements.	950	...	...	658	
	Ditto ...	Ditto ...	Ditto ...	Lock at 5½ miles at Kamalapuram.	20,310	...	...	5,000	
	Ditto ...	Ditto ...	Ditto ...	Lock at 15th mile at Paudvaka.	21,500	...	...	5,000	
	Ditto ...	Ditto ...	D. Regulators.	Improvements to supply weir at head.	1,060	...	...	800	
45	(4.) Drainages and Protective Works.	Polraz drain.	B. Land...	Polraz main drain.	15,370	...	300	500	11,800
	Ditto ...	Ditto ...	L. Earthwork.	Do. ...	61,120	...	12,000	6,000	
	Ditto ...	Ditto ...	B. Land...	Komaravole affluent.	7,260	...	718	500	
	Ditto ...	Ditto ...	L. Earthwork.	Do. ...	12,809	...	500	6,000	
	Ditto ...	Ditto ...	Ditto ...	Palakodu affluent.	2,078	...	...	1,500	
46	Ditto ...	Chendraya codu drain.	B. Land...	Chendraya codu main drain.	19,740	...	1,573	1,000	14,500
	Ditto ...	Ditto ...	L. Earthwork.	Do. ...	65,920	163	6,000	6,000	
	Ditto ...	Ditto ...	C. Works.	Culvert under Ryves' canal.	10,950	...	4,619	4,770	
47	Ditto ...	Pullava drain.	B. Land...	Pullava main drain.	750	...	100	200	11,770
	Ditto ...	Ditto ...	L. Earthwork.	Do. ...	12,700	...	2,000	3,000	
48	Ditto ...	Dammidi drain.	Ditto ...	Dammidi drain ...	5,986	...	...	1,000	3,200
49	Ditto ...	Pedda Kommileru drain and affluents.	Ditto ...	Lingala drain (Chinna Kommileru affluents).	21,815	...	...	6,000	1,000
50	Ditto ...	Pedalanka drain and affluents.	Ditto ...	Pedalanka drain.	89,923	...	...	4,090	6,000
									4,090
				TOTAL, GUDIVADI DIVISION.	...	...	...	...	1,26,000

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GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
				N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.	Rs.	Rs.	Rs.	Rs.	Rs.
				51. Irrigation and Navigation—continued.					
				KISTNA DELTA SYSTEM—*continued.*					
				Western Section					
51	(2.) Main Canals and Branches.	Main Canal.	B. Land...	Compensation for land.	3,500	2,000	1,500	...	
	Ditto ...	Ditto ...	L. Earth-work.	Widening ...	5,34,520	90,419	37,700	44,000	44,000
52	Ditto ...	Commamur Canal.	B. Land ..	Compensation for land.	7,780	4,248	4,000	...	
	Ditto ...	Ditto ...	F. River and hill torrent works.	Parcharvagu outlet.	2,130	...	...	2,000	
	Ditto ...	Ditto ...	Ditto ...	Swerna outlet ...	1,060	...	...	1,000	
	Ditto ...	Ditto ...	Ditto ...	Cheruku outlet ...	3,290	...	...	3,000	
	Ditto ...	Ditto ...	Ditto ...	Improvements to Alleru surplus weir.	2,550	...	1,500	1,050	
	Ditto ...	Ditto ...	Ditto ...	Firinghidibba inlet.	5,880	...	600	3,950	
	Ditto ...	Ditto ...	Ditto ...	Appapuram outlet.	8,970	...	...	3,000	
	Ditto ...	Ditto ...	F. Other cross drainage works.	Swerna aqueduct.	11,080	...	...	8,000	
	Ditto ...	Ditto ...	G. Bridges.	Bridge at Karenchedu.	9,760	...	4,000	5,700	
	Ditto ...	Ditto ...	Ditto ...	Coast road bridge.	10,600	...	...	2,300	
	Ditto ...	Commamur Canal.	I. Navigation.	Improvements to Jagerlamudi lock.	1,100	...	...	1,000	
	Ditto ...	Ditto ...	K. Buildings.	Nallamada rest house.	2,200	...	...	2,000	
	Ditto ...	Ditto ...	L. Earth-work.	Improvements to Commamur canal.	2,80,590	91,216	5,000	6,000	
	Ditto ...	Ditto ...	O. Miscellaneous.	Cattle crossi[illegible] Kunkalam[illegible].	1,100	...	500	600	
	Ditto ...	Ditto ...	Ditto ...	Do. Vadlam[illegible] ...	900	...	500	400	
	Ditto ...	Ditto ...	Ditto ...	Do. Duggi[illegible] ...	1,100	...	500	500	
	(3.) Distributaries.	Ditto ...	L. Earth-work.	Distributa[illegible] ...	1,43,233	38,233	...	5,000	45,500
53	(2.) Main Canals and Branches.	Bank Canal.	B. Land...	Compensa[illegible] for land.	...	...	...	...	
	Ditto ...	Ditto ...	I. Navigation.	Vellatur [illegible] ...	19,474	...	4,000	15,474	
	Ditto ...	Ditto ...	Ditto ...	Do. [illegible] ...	1,578	...	600	978	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay: To end of 1882-83.	Outlay: Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	Rs.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.							
		51. Irrigation and Navigation—continued.							
		KISTNA DELTA SYSTEM—*continued.*							
		Western Section—continued.							
	(2.) Main Canals and Branches —*cont.*	Bank Canal.	L. Earthwork.	Improvements ...	1,15,715	...	...	9,548	
	(3.) Distributaries.	Ditto ...	Ditto ...	Minor channels.	15,000	...	...	7,000	33,000
54	(4.) Drainages and Protective Works.	Répálle main drain.	B. Land.	Compensation for land.	18,300	...	650	7,000	
	Ditto ...	Ditto ...	G. Bridges.	Masonry bridges.	29,124	...	...	5,000	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements ...	1,42,700	9,992	...	28,000	40,000
55	Ditto ...	Tungabhadra drain.	B. Land...	Compensation for land.	17,092	...	80	4,000	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements ...	4,92,153	...	...	8,000	12,000
56	Ditto ...	Romperu drain.	B. Land...	Compensation for land.	1,500	...	...	1,000	
	Ditto ...	Ditto ...	L. Earthwork.	Improvements ...	1,60,810	...	...	9,000	10,000
				TOTAL, WESTERN SECTION.	...	...	...		1,84,500
				TOTAL KISTNA DELTA SYSTEM.	...	...	...		4,19,500
		SANGAM ANICUT PROJECT.							
57	(1.) Head Works.	Head Works.	C. Works.	Anicut	4,34,500	1,66,670	85,000	1,00,000	
	Ditto ...	Ditto ...	Ditto ...	Under-sluice ...	71,100	25,551	40,000	5,440	
	Ditto ...	Ditto ...	O. Miscellaneous.	Miscellaneous ...	11,215	6,525	6,000	1,000	
	Ditto ...	Ditto ...	P. Maintenance.	Repairs to temporary bridges.	2,890	...	700	500	1,06,940
58	(2.) Main Canals and Branches.	Kanigiri Canal.	B. Land ..	Kanigiri reservoir.	1,89,500	5,327	10,959	70,000	
	Ditto ...	Ditto ...	L. Earthwork.	Excavation and banking.	2,38,402	99,006	60,000	50,000	
	Ditto ...	Ditto ...	N. Tanks and reservoirs.	Kanigiri reservoir, earthwork and revetment, &c.	1,88,915	36,718	85,000	60,000	
	Ditto ...	Ditto ...	Do. ...	Surplus weir ...	41,805	17,999	16,000	5,000	
	Ditto ...	Ditto ...	O. Miscellaneous.	Gandavaram head-sluice demolishing.	100	...	...	100	1,85,100

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GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay: To end of 1882-83.	Outlay: Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	Rs.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued							
		51. Irrigation and Navigation—continued.							
		SANGAM ANICUT SYSTEM—*continued.*							
59	(2) Main Canals and Branches —*cont.*	Duvur Canal.	L. Earth-work.	Excavation and banking.	2,000	...	...	2,000	
	Ditto ...	Ditto ...	N. Tanks and reservoirs.	Duvur reservoir improvements.	8,935	...	2,000	3,930	5,930
60	(3.) Distributaries.	Eastern Channel.	C. Works.	Head-sluice ..	20,620	9,854	5,000	5,000	
	Ditto ...	Ditto ...	Ditto ...	Fall No. 1 ...	4,800	...	2,000	2,800	
	Ditto ...	Ditto ...	Ditto ...	Ditto 2 ...	4,800	...	2,000	2,800	
	Ditto ...	Ditto ..	Ditto ...	Ditto 3 ...	4,800	...	2,000	2,800	
	Ditto ...	Ditto ...	Ditto ...	Ditto 4 ...	4,800	...	2,000	2,800	
	Ditto ...	Ditto ...	Ditto ...	Irrigation sluice, No. 1	1,010	...	...	1,000	
	Ditto ...	Ditto ...	Ditto ...	Ditto No. 2 ...	1,010	...	...	1,000	
	Ditto ...	Ditto ...	Ditto ...	Ditto No. 3 ...	1,010	...	...	1,000	
	Ditto ...	Ditto ...	Ditto ...	Ditto No. 4 ...	1,010	...	...	1,000	
	Ditto ...	Ditto ...	Ditto ...	Ditto No. 5 ...	1,010	...	...	1,000	
	Ditto ...	Ditto ...	Ditto ...	Ditto No. 6 ...	1,010	...	...	800	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation and banking.	1,11,147	889	50,000	20,000	42,000
61	Ditto ...	Yellayapalem branch channel.	C. Works.	Regulating sluice.	950	...	...	950	
	Ditto ...	Ditto ..	Ditto ...	2 drainage culverts.	6,400	...	...	3,000	
	Ditto ...	Ditto ...	Ditto ...	1 drop	1,610	...	...	1,600	
	Ditto ...	Ditto ...	Ditto ...	3 Irrigation sluices.	3,030	...	...	1,500	
	Ditto ...	Ditto ..	L. Earth-work.	Excavation and banking.	3,200	...	1,000	2,200	9,250
62	Ditto ...	Alleru channel.	B. Land ...	Compensation for land.	4,450	...	...	4,000	
	Ditto ...	Ditto ...	C. Works.	Head-sluice ...	9,250	...	...	5,000	
	Ditto ...	Ditto ...	Ditto ...	Regulator and bridge.	6,100	...	...	3,000	
	Ditto ...	Ditto ...	Ditto ...	Pyderu dam, north weir, lowering crest.	30	...	...	30	
	Ditto ...	Ditto ...	Ditto ...	2 irrigation sluices.	2,140	...	...	1,000	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation ...	2,260	...	...	2,260	
	Ditto ...	Ditto ...	Ditto ...	Embankment between the 2 weirs of the Pyderu dam weirs.	250	...	...	250	15,540

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay: To end of 1882-83.	Outlay: Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	Rs.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.							
		51. Irrigation and Navigation—continued.							
		SANGAM ANICUT SYSTEM—*continued.*							
63	(3.) Distributaries—*cont.*	Alleru Branch Channel.	B. Land.	Compensation for land.	4,450	...	...	3,450	
	Ditto ...	Ditto ...	C. Works.	Regulating sluice.	4,350	...	500	1,500	
	Ditto ...	Ditto ...	Ditto ...	Two falls in the 1st and 2nd miles.	14,080	...	...	5,000	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation and banking.	11,570	...	1,000	8,000	17,950
64	Ditto ...	Southern Channel.	B. Land.	Compensation for land.	1,510	...	...	510	
	Ditto ...	Ditto ...	C. Works.	Bridge	5,330	...	...	4,000	
	Ditto ...	Ditto ...	Ditto ...	Drainage culvert.	6,000	...	...	3,000	
	Ditto ...	Ditto ...	Ditto ...	Regulating sluice	4,100	...	500	2,000	
	Ditto ...	Ditto ...	Ditto ...	Drainage culvert.	10,400	...	...	5,000	
	Ditto ...	Ditto ...	Ditto ...	Bridge	1,940	...	...	1,940	
	Ditto ...	Ditto ...	Ditto ...	Two irrigation sluices.	2,020	...	...	1,200	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation and banking.	24,640	24	1,000	20,000	
	Ditto ...	Ditto ...	Ditto ...	One distribution channel	600	...	...	600	
	Ditto ...	Ditto ...	Ditto ...	Ditto	350	...	...	350	
	Ditto ...	Ditto ...	B. Land.	Compensation for land.	4,575	...	...	1,800	
	Ditto ...	Ditto ...	C. Works.	Two bridges, 2nd and 3rd mile.	2,400	...	...	2,400	
	Ditto ...	Ditto ...	Ditto ...	Drainage culvert, 4th mile.	2,250	...	...	1,700	
	Ditto ...	Ditto ...	Ditto ...	Two drainage culvert, fifth miles.	13,200	...	...	4,000	
	Ditto ...	Ditto ...	Ditto ...	One fall in 6th mile.	4,550	...	...	2,000	
	Ditto ...	Ditto ...	Ditto ...	One fall in 9th mile.	3,900	...	...	1,500	
	Ditto ...	Ditto ...	Ditto ...	One aqueduct, 9th mile.	2,400	...	...	1,500	
	Ditto ...	Ditto ...	Ditto ...	One bridge, 11th mile.	1,450	...	...	1,450	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation and banking.	1,07,395	...	1,000	18,050	
	Ditto ...	Ditto ...	Ditto ...	Bank across the head of Mudivarthi tank and supply channel.	50	...	...	50	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay: To end of 1882-83.	Outlay: Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	Rs.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.							
		51. Irrigation and Navigation—continued.							
		SANGAM ANICUT SYSTEM—*continued.*							
	(3) Distributaries—*cont.*	Southern Channel—*cont.*	L. Earth-work—*cont.*	Three distribution channels.	1,800	...	...	1,800	
	Ditto ...	Ditto ..	Ditto ...	Six do. do. ...	1,500	...	...	1,500	
	Ditto ...	Ditto ...	Ditto ...	One distribution channel.	300	...	...	300	
	Ditto ...	Ditto ...	Ditto ...	Three ditto ...	450	...	...	450	
	Ditto ...	Ditto ...	Ditto ...	Three ditto ...	600	...	...	600	
	Ditto ...	Ditto ...	Ditto ...	One ditto ...	350	...	...	350	
	Ditto ...	Ditto ...	Ditto ...	Two ditto ...	200	...	...	200	
	Ditto ...	Ditto ...	Ditto ...	One ditto ...	1,900	...	...	1,900	
	Ditto ...	Ditto ...	Ditto ...	One ditto ...	400	...	...	400	
	Ditto ...	Ditto ...	Ditto ...	One ditto ...	500	...	...	500	
	Ditto ...	Ditto ...	Ditto ...	One ditto ...	750	...	...	750	
									81,800
65	Ditto ...	Central Channel.	B. Land.	Compensation for land.	1,240	...	...	240	
	Ditto ...	Ditto ...	C. Works.	Regulating sluice.	2,250	...	500	1,500	
	Ditto ...	Ditto ...	Ditto ..	Fall in 4th mile.	2,770	...	...	1,200	
	Ditto ...	Ditto ...	Ditto ...	Road tunnel, 5th mile.	1,310	...	...	1,000	
	Ditto ...	Ditto ...	Ditto ...	Fall in the 9th mile.	2,800	...	...	1,500	
	Ditto ...	Ditto ...	Ditto ...	Eleven irrigation sluices.	11,100	...	...	6,000	
	Ditto ...	Ditto ...	Ditto ...	Six irrigation sluices.	6,420	...	...	3,000	
	Ditto ...	Ditto ...	L. Earth-work.	Excavation and banking.	19,750	62	5,000	16,000	
	Ditto ...	Ditto ...	Ditto ...	Two distribution channels, at Rs 200 each.	400	...	...	400	
				2 do. at Rs. 225	450	...	...	450	
				2 do. at ,, 250	500	...	...	500	
				2 do. at ,, 350	700	...	...	700	
				2 do. at ,, 325	650	...	...	650	
				4 do. at ,, 275	1,100	...	...	1,100	
	Ditto ...	Ditto ...	Ditto ...	Two distribution channels at Rs. 375 each.	750	...	...	750	
				1 do. at Rs. 500	500	...	...	500	35,490
				TOTAL, SANGAM ANICUT PROJECT.	...	...	...		5,00,000

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		BARUR TANK PROJECT.							
66	(1.) Head Works.	...	C. Works.	Nedungal anicut across the Ponniár.	18,035	...	...	18,000	18,000
67	(2.) Main Canals and Branches.	Agaram channel.	D. Regulators.	Agaram channel head-sluice.	9,600	...	...	4,000	
	Ditto ...	Ditto ...	L. Earthwork.	New head to Agaram channel	1,055	...	...	1,000	5,000
68	Ditto ...	Barur tank supply channel.	Ditto ...	Barur tank supply channel.	48,004	...	4,000	25,000	
	Ditto ...	Ditto ...	D. Regulators	Head-sluices ...	5,210	...	...	3,000	
	Ditto ...	Ditto ...	F (1.) Other cross drainage works.	Fifteen inlets ...	557	...	...	500	
	Ditto ...	Ditto ...	Ditto ..	Seventeen outlets	3,771	...	...	2,500	
	Ditto ...	Ditto ...	N. Tanks.	Barur tank bund.	53,115	...	4,035	15,000	46,000
				TOTAL, BARUR TANK PROJECT.	...	...	...	...	69,000
		CAUVERY DELTA SYSTEM.							
69	(1.) Head Works.	...	C. Works.	Grand anicut alterations.	55,950	...	1,640	36,000	
	Ditto ...	...	Ditto ...	Dam at Vennár head.	12,295	...	...	7,300	43,300
70	(2.) Main Canals and Branches.	Cauvery ...	D. Regulators.	Cauvery head-sluice.	1,59,640	14,483	48,618	60,000	60,000
71	Ditto ...	Vennaur ...	B. Land.	Compensation for land.	35,550	12,442	...	13,000	
	Ditto ...	Ditto ...	D. Regulators.	Head-sluice ...	1,24,000	...	27,500	50,000	
	Ditto ...	Ditto ...	F (1.) Other cross drainage works.	Under-tunnel right bank.	13,160	...	...	9,000	
	Ditto ...	Ditto ...	Ditto ...	Under-tunnel 2 feet span left bank.	1,320	...	...	1,000	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85—*cont.*

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
					Rs.	Rs.	Rs.	Rs.	Rs.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.							
		51. Irrigation and Navigation—continued.							
		Cauvery Delta System—*continued.*							
	(2.) Main Canals and Branches.	Vennár ...	L. Earth-work.	Excavation ...	51,250	...	1,400	33,000	
	(3.) Distributaries.	Ditto ...	C. Works.	Pillay-Voikal head-sluice.	2,300	...	...	2,000	
	Ditto ...	Ditto ...	Ditto ...	Pillay Voikal sluice.	435	...	...	400	
	Ditto ...	Ditto ...	L. Earth-work.	Pillay Voikal channel.	310	...	...	300	1,08,700
				Total, Cauvery Delta System.	...	...	...	...	2,12,000
		Srivaikuntham Anicut System.							
		Northern Section.							
72	(2.) Main Canals and Branches.	North Main Channel.	B. Land.	Korampullum tank compensation for land.	15,553	...	10,553	5,000	
	Ditto ...	Ditto ...	Ditto ...	Maruduni tank compensation for land.	7,053	...	6,620	433	
	Ditto ...	Ditto ...	Ditto ...	Pottukulam tank.	1,363	...	759	604	
	Ditto ...	Ditto ...	F. (1) Other cross drainage works.	Outlet at 9 miles 60 chains.	10,750	3,534	5,773	1,443	
	Ditto ...	Ditto ...	Ditto ...	Revetting left bank, 8 miles 60 chains.	3,680	1,199	2,106	329	
	Ditto ...	Ditto ...	Ditto ...	Yeral bridge alterations.	2,060	473	1,180	407	
	Ditto ...	Ditto ...	N. Tanks and reservoirs.	Korampullum tank revetment.	79,060	76,429	...	2,631	
	Ditto ...	Ditto ...	Ditto ...	Upper Odai dam.	39,310	34,761	...	4,549	
	Ditto ...	Ditto ...	Ditto ...	Korampullum tank cutting the banks of surplus drain and revetting the tank bank.	4,738	2,505	...	2,003	
	(3.) Distributaries.	Ditto ...	C. Works.	Small sluices ...	9,000	7,508	...	1,492	
	Ditto ...	Ditto ...	L. Earth-work.	Melavallam and Mulakadu channel improvements.	3,690	...	...	3,690	

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85.

Item No.	Main Head.	Name of Canal.	Sub-Head.	Individual Works.	Amount of Estimate.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item Total.
1	2	3	4	5	6	7	8	9	10
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.			Rs.	Rs.	Rs.	Rs.	Rs.
		51. Irrigation and Navigation—continued.							
		SRIVAIKUNTHAM ANICUT SYSTEM—*continued.*							
		Northern Section—continued.							
	(3.) Distributaries.	North Main Channel.	L. Earthwork.	Minor Channels...	25,500	21,317	...	4,066	
	(4.) Drainages and Protective Works.	Ditto ...	B. Land.	Compensation for land for Upper Odai embankment.	1,841	...	...	1,841	
	(3.) Distributaries.	Tuticorin Channel.	Ditto ...	Tuticorin channel compensation for land.	575	518	...	57	
									28,545
				TOTAL, NORTHERN SECTION.	...	...	...	...	28,545
		Southern Section.							
73	(2.) Main Canals and Branches.	South Main Channel.	B. Land.	Widening the main channel.	11,349	9,796	...	1,553	
	(3.) Distributaries.	Authur Channel.	Ditto ...	Land compensation for new Authur channel.	2,117	1,939	...	178	
	Ditto ...	Ditto ...	Ditto ...	Land compensation for Old Authur channel.	469	...	...	469	
	Ditto ...	Ditto ...	Ditto ...	Compensation for land for Authur and Keeranur tanks.	332	...	...	332	
	Ditto ...	Ditto ...	Ditto ...	Compensation for land for Authur Channel.	2,586	...	...	647	
	Ditto ...	Ditto ...	C. Works.	Improving irrigation sluices.	4,446	817	3,107	522	
	Ditto ...	Ditto ...	L. Earthwork.	Authur channel improvements.	4,551	...	2,051	2,500	
	Ditto ...	Ditto ...	N. Tanks and reservoirs.	Authur and Keeranur tank improvements.	10,531	1,093	8,854	584	
	Ditto ...	Ditto ...	Ditto ...	Authur ditto ...	85	...	...	85	
	Ditto ...	Ditto ...	Ditto ...	Kuranur ditto ...	247	...	...	247	
									7,117
				TOTAL, SOUTHERN SECTION.	...	...	...	...	7,117
				TOTAL, SRIVAIKUNTHAM ANICUT SYSTEM.	...	...	...	...	35,662

FINAL ISSUE.

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PUBLIC WORKS NOT CLASSED AS PRODUCTIVE—IRRIGATION AND NAVIGATION—AND FAMINE RELIEF AND INSURANCE—IRRIGATION.

MADRAS PRESIDENCY.

PUBLIC WORKS DEPARTMENT.

BUDGET ESTIMATE

OF

PUBLIC WORKS NOT CLASSED AS PRODUCTIVE—IRRIGATION AND NAVIGATION—

AND

FAMINE RELIEF AND INSURANCE—IRRIGATION,

IN THE

MADRAS PRESIDENCY,

IMPERIAL AND PROVINCIAL.

FOR THE YEAR

1884-85.

(Signed) J. O. HASTED, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

29th April 1884.

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GOVERNMENT OF MADRAS.

BUDGET ESTIMATE OF THE REVENUE FROM IRRIGATION AND NAVIGATION, AGRICULTURAL AND PROTECTIVE WORKS, IN THE MADRAS PRESIDENCY FOR THE YEAR FROM 1st APRIL 1884 TO 31st MARCH 1885.

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Realization
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
H. RECEIPTS ON ACCOUNT OF PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.				
XXVI. IRRIGATION AND NAVIGATION.				
MPERIAL.				
Works for which Capital and Revenue Accounts are kept.				
Chembrambakam Tank	50	100	100	85
Pálár Anicut System	550	270	270	266
Pelandorai Anicut System	50	50	50	...
Total Works for which Capital and Revenue Accounts are kept ...	650	420	420	351
Works for which neither Capital nor Revenue Accounts are kept ...	12,000	12,000	15,000	12,146
Agricultural Works	10,000	10,000	19,000	10,130
Total, Imperial ...	22,650	22,420	34,420	22,627
PROVINCIAL.				
Madras Water-supply and Irrigation Extension Project	5,960	30,000	12,000	32,336
Buckingham Canal	33,100	42,580	1,17,000	1,08,127
Total, Provincial ...	39,060	72,580	1,29,000	1,40,463
Grand Total ...	61,710	95,000	1,63,420	1,63,090

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GOVERNMENT OF MADRAS.

ABSTRACT BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION, AGRICULTURAL AND PROTECTIVE WORKS, IN THE MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1884 TO 31ST MARCH 1885.

—	Reference to Detailed Estimate.	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Outlay, 1882-83.
1	2	3	4	5	6
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Page.	Rs.	Rs.	Rs.	Rs.
44. IRRIGATION AND NAVIGATION.					
IMPERIAL.					
Works for which Capital and Revenue Accounts are kept.					
CAPITAL.					
I.—Works	7 & 8	...	3,289	58,634	—92,872
II.—Establishment	16	...	...	13,487	—23,511
III.—Tools and Plant	18	...	...	879	— 1,642
Total ...		...	3,289	73,000	—1,18,025
REVENUE.					
I-A.—Extensions and Improvements	7 & 8	3,480	11,509	8,619	3,648
I-B.—Maintenance and Repairs	11	25,436	49,630	29,500	62,035
II.—Establishment	16	6,716	14,105	8,809	14,971
III.—Tools and Plant	18	368	335	572	900
Total ...		36,000	75,579	47,500	81,554
Works for which neither Capital nor Revenue Accounts are kept.					
Works	7 & 8	4,03,883	2,58,830	2,09,807	2,36,430
Repairs	11	10,50,766	10,45,382	9,20,000	9,24,237
Establishment	16	4,70,636	4,29,191	1,76,256	3,90,721
Tools and Plant	18	15,715	35,338	11,397	15,930
Total ...		19,41,000	17,68,741	13,17,460	15,67,318

GOVERNMENT OF MADRAS.

ABSTRACT BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION, AGRICULTURAL AND PROTECTIVE WORKS, IN THE MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1884 TO 31ST MARCH 1885—*cont.*

—	Reference to Detailed Estimate.	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Outlay, 1882-83.
1	2	3	4	5	6
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE—continued.	Page.	Rs.	Rs.	Rs.	Rs.
44. IRRIGATION AND NAVIGATION—continued.					
Agricultural.					
Works	9 & 10	1,70,482	1,70,914	2,44,000	1,61,870
Repairs	11	1,50,000	1,84,300	1,50,000	2,94,193
Establishment	16	74,711	80,400	1,39,260	1,05,142
Tools and Plant	18	4,807	5,178	7,080	6,788
Total ...		4,00,000	4,40,792	5,40,340	5,67,993
Totals.					
Works	7 to 10	5,77,845	4,44,542	5,21,060	3,09,076
Repairs	11	12,26,202	12,79,312	10,99,500	12,80,465
Establishment	16	5,52,063	5,23,696	3,37,812	4,87,323
Tools and Plant	18	20,890	40,851	19,928	21,976
Grand Total ...		23,77,000	22,88,401	19,78,300	20,98,840
PROVINCIAL.					
Capital Account.					
Works	9 & 10	1,69,556	1,13,660	1,88,354	1,43,523
Establishment	16	73,499	56,733	43,321	29,701
Tools and Plant	18	500	13,500	2,825	1,936
Total ...		2,43,555	1,83,893	2,34,500	1,75,160
Revenue Account.					
Extensions and Improvements	9 & 10	5,000	5,228	5,000	6,081
Maintenance and Repairs	11	77,659	1,31,875	77,410	1,24,321
Establishment	16	22,918	38,791	31,854	44,038
Tools and Plant...	18	1,368	1,106	1,236	3,258
Refunds of Revenue		...	...	...	244
Total ...		1,06,945	1,77,000	1,15,500	1,77,942
Totals.					
Works	9 & 10	1,74,556	1,18,888	1,93,354	1,49,604
Repairs	11	77,659	1,31,875	77,410	1,24,321
Establishment	16	96,417	95,524	75,175	73,739
Tools and Plant	18	1,868	14,606	4,061	5,194
Refunds of Revenue		...	...	...	244
Total ...		3,50,500	3,60,893	3,50,000	3,53,102
Grand Total ...		27,27,500	26,49,294	23,28,300	24,51,942
F. FAMINE RELIEF AND INSURANCE.					
34. PROTECTIVE WORKS—IRRIGATION.					
Imperial.					
Capital.					
Works	9 & 10	3,50,000	1,36,661	64,000	3,563
Establishment	16	46,000	39,208	1,23,500	57,943
Tools and Plant	18	3,000	3,322	12,500	2,747
Total ...		3,99,000	1,79,191	2,00,000	64,253

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GOVERNMENT OF MADRAS.

PART I.

BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION, AGRICULTURAL AND PROTECTIVE WORKS, IN THE MADRAS PRESIDENCY, FOR THE YEAR 1884-85, ARRANGED BY SYSTEMS.

——	Amount of Estimate.	Actual Outlay to end of 1882-83.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Budget Estimate, 1884-85.	Remarks and References.
1	2	3	4	5	6	7
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.	Rs.	Rs.	Rs.	
44. IRRIGATION AND NAVIGATION.						
Imperial.						
Works for which Capital and Revenue Accounts are kept.						
Capital.						
Works in progress.						
Pálár Anicut System	13,19,498	15,92,004	...	48,000	...	Completion estimates will be submitted shortly.
Pelandorai Anicut System ...	3,65,588	3,53,542	3,289	25,000	...	Government of India Register No. 38 I. of 1877-78 and No. 1 I. of 1881-82, and Proceedings, Madras Government, No. 642 I., dated 16th August 1878.
Total ...	16,85,086	19,45,546	3,289	73,000	...	
Revenue.						
Working Expenses and Maintenance.						
Chembrambakam Tank ...	...	...	12,375	6,360	— 1,000	
Pálár Anicut System	...	...	32,929	29,907	26,000	
Pelandorai Anicut System ...	...	...	30,275	11,233	11,000	
Total ...	...	...	75,579	47,500	36,000	
Works for which neither Capital nor Revenue Accounts are kept.	...	...	17,68,741	13,17,460	19,41,000	
Agricultural Works	...	...	4,40,792	5,40,340	4,00,000	
Total, Imperial ...	...	...	22,88,401	19,78,300	23,77,000	
PROVINCIAL.						
Capital Account.						
Buckingham Canal	86,12,000	48,92,525	1,40,973	1,96,500	2,20,000	Government of India Register No. 15 I. of 1883-84. Proceedings of Madras Government, No. 625 I., dated 9th August 1883, and No. 195 I., dated 16th February 1884.
Madras Water-supply and Irrigation Extension Project.	15,80,995	14,72,958	42,920	38,000	23,555	Government of India Register No. 16 I. of 1883-84, and Proceedings of Madras Government, No. 307 I., dated 19th March 1884.
Total ...	1,01,92,995	63,65,483	1,83,893	2,34,500	2,43,555	
Revenue Account.						
Buckingham Canal	...	...	1,63,200	1,03,500	95,000	
Madras Water-supply and Irrigation Extension Project.	...	...	13,800	12,000	11,945	
Total ...	...	...	1,77,000	1,15,500	1,06,945	
Total, Provincial ...	...	...	3,60,893	3,50,000	3,50,500	

GOVERNMENT OF MADRAS.

PART I—continued.

BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION, AGRICULTURAL AND PROTECTIVE WORKS, IN THE MADRAS PRESIDENCY, FOR THE YEAR 1884-85, ARRANGED BY SYSTEMS—*cont.*

—	Amount of Estimate	Actual Outlay to end of 1882-83.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Budget Estimate, 1884-85.	Remarks and References.
1	2	3	4	5	6	7
F. FAMINE RELIEF AND INSURANCE.	Rs.	Rs.	Rs.	Rs.	Rs.	
34. PROTECTIVE WORKS—IRRIGATION.						
Imperial.						
Rushikulya Project	26,01,386	6,270	3,000	84,000	2,49,000	Government of India Register No. 16 I. of 1882-83. Proceedings of Madras Government, No. 147 I., dated 13th February 1883, and Proceedings of Madras Government, No. 500 I. of 23rd June 1883.
Hindupur and Roddam Project.	...	5,944	...	...	...	
Bellary Project	...	588	...	33,000	...	
Sugglair do.	...	...	8,026	...	...	
Peddapasupala tank	...	...	700	...	...	
Pálár Anicut Channels ...	...	8,275	3,892	...	...	
Barúr Tank Project	...	1,242	— 1,242	...	...	
Marandahully Project	...	1,664	...	...	...	
Calingaroyan Channel	...	...	5,090	...	...	
Krishnagiri Reservoir	...	11,478	3,000	15,000	...	
Vaniar Project	...	11,930	2,988	...	..	
Lower Coleroon Project ...	...	...	...	2,000	...	
Bhaváni do. ...	...	...	16,637	15,000	...	
Periyár do. ...	...	5,391	...	...	...	
Pápanásanam do. ...	...	...	...	18,000	...	
Buckingham Canal	...	48,581	1,33,000	...	1,50,000	
Ganjam-Gopálpúr Tidal Canal.	...	15,346	3,829	33,000	...	
Canal from Sámalkót to Tuni ...	...	...	271	...	...	
Total ...		1,16,709	1,79,191	2,00,000	3,99,000	

BUDGET ESTIMATE OF EXPENDITURE IN ENGLAND.

—	Budget Estimate for 1884-85.				Revised Estimate for 1883-84.	Budget Estimate, 1883-84.	Actual Outlay, 1882-83.	—
	Works.	Tools and Plant.	Suspense Account.	Total.				
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
44. Irrigation and Navigation.								
Imperial.								
Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept	...	...	...	...	15,000	18,500	10,568	
PROVINCIAL.								
Buckingham Canal ...	...	...	...	...	12,000	...	...	

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GOVERNMENT OF MADRAS.

PART II.

DETAIL OF BUDGET ESTIMATES FOR WORKS FOR THE YEAR 1884-85.

Divisions.	Item No.	Details.	Amount of Estimates.	A. B. or C. Class.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item No.	Remarks and References.
		H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.	Rs.	Rs.	Rs.		
		44. IRRIGATION AND NAVIGATION.							
		IMPERIAL.							
		Works for which Capital and Revenue Accounts are kept.							
		CAPITAL.							
		Nil.							
		REVENUE.							
		Extensions and Improvements.							
Chingleput	1	Chembrambakam tank	...	B ...	...	1,600	1,000	1	
		Deduct old maintenance charges	...	...	...	2,283	2,283		
		Net ...	...	...	...	−683	−1,283		
South Arcot	2	Pelandorai Anicut System	...	B ...	...	8,429	1,000	2	
		Deduct old maintenance charges	...	...	...	59	59		
		Net ...	...	...	...	8,370	941		
North Arcot	3	Pálár Anicut System	...	B ...	...	4,000	4,000	3	For minor improvements which are for the most part within the Superintending Engineer's power of sanction.
		Deduct old maintenance charges	...	...	...	178	178		
		Net ...	...	...	...	3,822	3,822		
		Total Revenue ...	...	...	...	...	6,000		
		Deduct old maintenance charges ...	...	...	...	...	2,520		
		Net Revenue ...	...	...	...	...	3,480		
		Works for which neither Capital nor Revenue Accounts are kept.							
Nellore	4	Zaladanki tank weirs	3,485	B ...	...	...	2,750	4	G.O., No. 270 I., dated 29th March 1883.
Do.	5	Zammalapalem tank	3,020	B ...	...	...	1,020	5	G.O., No. 464 I., dated 12th June 1883.
Do.	6	Bogavalu tank	5,654	...	...	...	5,654	6	G.O., No. 605 I., dated nd August 1883.
Do	7	Bitragunta tank	2,716	...	...	...	1,716	7	G.O., No. 427 I., dated 29th May 1883.
Bellary	8	Bookapatam tank improvements	18,930	B ...	5,000	9,000	4,930	8	G.O., No. 334 I., dated 4th April 1882.
Coimbatore	9	Chitrachavady channel improvements	39,533	B ...	16,500	14,810	8,223	9	G.O., No. 460 I., dated 2th June 1882.
Do.	10	Pullapollem channel improvements	21,300	B ...	...	5,000	10,300	10	G.O., No. 285 I., dated 1st March 1883.
Do.	11	Kalingaroyen channel aqueduct	6,560	B ...	1,500	4,790	1,870	11	G.O., No. 606 I., dated nd August 1883.
South Arcot	12	Allangal channel head-sluice	9,250	B ...	...	8,000	4,250	12	G.O., No. 175 I., dated 3rd February 1883.
	13	Allangal channel improvements	7,946	B ...	...	...	4,887	13	G.O., No. 463 I., dated 2th June 1883.
	14	Veyalore tank improvements	5,440	B ...	...	...	2,940	14	G.O., No. 286 I., dated 31st March 1883.
Do.	15	Chengam tank improvements	6,521	B ...	...	383	3,520	15	G.O., No. 278 I., dated 30th March 1883.
Presidency	16	Mylapore tank improvements	8,523	B ...	...	4,900	3,523	16	G.O., No. 237 I., dated 5th March 1883.
Negapatam	17	Ollacanum Terkuyeri tank improvements	4,920	B ...	...	3,000	1,920	17	G.O., No. 160 I., dated 7th February 1883.
Tinnevelly	18	Manur channel improvements	22,500	B ...	...	14,132	7,068	18	G.O., No. 373 I., dated th May 1883.
Do.	19	Pallicotai channel	5,210	B ...	...	1,743	5,210	19	G.O., No. 617 I., dated 7th August 1883.
Do.	20	Wattrap Periyakolam improving surplus works ...	5,685	B ...	...	1,000	5,685	20	G.O., No. 1008 I., dated 10th December 1883.
Do.	21	Papankal channel head-sluice	4,940	B ...	...	...	4,532	21	G.O., No. 36 I., dated 5th January 1884.
No. 1 Tank Division ...	22	Improving tanks	...	...	...	12,000	75,000	22	Lump sum provision.
No. 2 do. ...	23	Do.	...	...	...	...	1,21,970	23	Do.
	24	Old maintenance charges for works for which Capital and Revenue Accounts are kept.	...	...	...	...	6,436	24	
	25	Minor Original Works	...	...	...	...	1,20,479	25	
		Total ...	...	...	...	...	4,03,883		

GOVERNMENT OF MADRAS.

PART II—continued.

DETAIL OF BUDGET ESTIMATE FOR WORKS FOR THE YEAR 1884-85—*continued.*

Divisions.	Item No.	Details.	Amount of Estimate.	A. B. or C. Class.	Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item No.	Remarks and References.
		AG RICULTURAL WORKS.	Rs.		Rs.	Rs.	Rs.		
		ORIGINAL WORKS.							
		River Embankments.							
Godávari Eastern ...	26	Gowtami Godáva i L. B., Rajahmundry to Yanam ...	57,990	B ...	34,753	6,000	8,300	26	G.O., No. 2575, of 27th September 1876.
Do. ...	27	Godávari L. B. f om Purushottapatam to Rajahmundry.	1,25,110	B ...	94,265	14,000	10,000	27	G.O., No. 708, of 18th March 1876.
Do. ...	28	Tharrigeddavago out-fall sluice	26,380	B ...	...	10,000	12,000	28	G.O., No. 856 I., of 24th October 1882.
Godávari Central ...	29	Vassista Godávar L. B. to Gannaram aqueduct ...	34,400	B ...	22,513	3,000	5,000	29	G.O., No. 3373, of 12th December 1876.
Do. ...	30	Gowtami Godáva ri and Virdha Gowtami Godávari to Mokaltippa	68,670	B ...	30,375	9,000	5,000	30	G.O., No. 346 I., of 25th September 1877.
Do. ...	31	Polaveram Island embankment	59,150	B ...	44,563	3,000	3,000	31	G.O., No. 95 I., of 22nd January 1877.
Do. ...	32	Vassista Godávar L. B. below Gunnaram aqueduct ...	28,535	B ...	3,237	5,000	3,000	32	G.O., No. 349 I., of 27th September 1877.
Do. ...	33	Vynateyam Goda vari R. B. improvements	9,925	B ...	...	...	3,000	33	G.O., No. 618 I., dated 22nd November 1877.
Do. ...	34	Do. do. L. B. do.	9,675	B ...	...	...	3,000	34	(G.O., No. 618 I., dated 22nd November 1877.)
Godávari Western ..	35	Godávari, R. B. from Vijeshweram to Polaram ...	1,48,730	A ...	1,15,131	10,000	23,200	35	G.O., No. 1998 I., of 4th August 1876.
Do. ...	36	Vassista Godávar R. B. from anicut to Narsápur lock...	65,200	A ...	62,745	1,700	475	36	G.O., No. 713 I., of 6th December 1879.
Kistna Eastern ...	37	Kistna river, L. B. below anicut	55,464	B ...	31,942	12,000	10,000	37	G.O., No. 814 I., of 13th October 1882.
Do. Western ...	38	Do. R. B. do.	23,850	B ...	...	10,000	10,000	38	G.O., No. 301 I., of 4th April 1883.
Cuddapah	39	Pápaghni right e mbankment above railway	17,740	B ...	1,557	2,000	6,207	39	G.O., No. 634 I., of 11th August 1883.
Do.	40	North or left emb ankment of Cheyár river	12,557	B ...	...	...	10,000	40	G.O., No. 665 I., of 20th " "
Tinnevelly	41	Támbraparni rive r, R. B., below Srívaikuntham anicut...	83,598	B ...	25,832	11,105	20,000	41	G.O., No. 351 I., of 26th April 1883.
	42	Do. L. B., do. do. to 7½ miles	35,712	B ...	...	...	20,000	42	(G.O., No. 351 I., of 26th April 1883.)
	43	Do. L. B., do. from 7½ miles to sea.	47,872	C ...	...	13,200	...	43	G.O., No. 990 I., of 4th December 1883.
Do.	44	Minor Original Works	...	B ...	...	...	18,000	44	
		Total ...	...	...	...	...	1,70,482		
		PROVINCIAL.							
		IRRIGATIO N AND NAVIGATION WORKS.							
		Capital Account.							
Buckingham Canal ...	45	Buckingham Can al	68,24,843	B ...	38,42,051	78,766	1,50,406	45	G.O., No. 841 W., dated 14th March 1883. Government of India register No. 15 I., of 1883-84, Proceedings of Madras Government, No. 195 I., dated 16th February 1884.
Chingleput ...	46	Madras Water S upply and Irrigation Extension Project.	13,52,837	B ...	12,62,895	34,894	19,150	46	Government of India register No. 16 I., of 1883-84, Proceedings of Madras Government, No. 307 I., dated 19th March 1884.
		Total ...	...	...	...	...	1,69,556		
		REVENUE ACCOUNT.							
		Exte nsions and Improvements.							
Buckingham Canal ...	47	Buckingham Can al	...	B ...	...	5,000	5,000	47	For minor improvements which are for the most part within the Superintending Engineer's power of sanction.
Chingleput ...	48	Madras Water S upply and Irrigation Extension Project.	...	C ...	...	228	...	48	(For minor improvements which are for the most part within the Superintending Engineer's power of sanction.)
		Total ...	...	...	...	...	5,000		
		F. FAMINE RELIEF AND INSURANCE.							
		PROTECT IVE WORKS–IRRIGATION.							
		IMPERIAL.							
		Capital Account.							
Rushikulia Project Division.	49	Rushikulya Proj ect	20,76,654	A ...	...	...	2,00,000	49	G.O., No. 147 I., dated 13th February 1883, and G.O. No. 500 I., dated 23rd June 1883. Government of India register No. 8 I. of 1883-84.
Buckingham Canal ...	50	Buckingham Ca nal	...	...	37,163	1,33,000	1,50,000	50	Grant-in-aid in addition to the allotment from Provincial Funds Budget Item No. 45.
		Total ...	...	...	...	...	3,50,000		

GOVERNMENT OF MADRAS.

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PART II—continued.

GENERAL ABSTRACT OF THE GRANT PROVIDED FOR IN THE PRECEDING ESTIMATE.

—	Imperial Funds.			Contribution.	Provincial Funds.	Total.
	In India.	In England.	Total.			
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
44. IRRIGATION AND NAVIGATION—IMPERIAL.						
IRRIGATION AND NAVIGATION WORKS—REVENUE.						
Chembrambakam Tank	—1,283	...	—1,283	...	...	—1,283
Pálár Anicut System	3,822	...	3,822	...	...	3,822
Pelandorai Anicut System	941	...	941	...	...	941
Total ...	3,480	...	3,480	...	...	3,480
IRRIGATION AND NAVIGATION WORKS FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUNTS ARE KEPT.						
Major Works	79,998	...	79,998	...	...	79,998
Minor Works	1,20,479	...	1,20,479	...	...	1,20,479
Lump sum provision for expenditure in the Tank divisions	1,96,970	...	1,96,970	...	...	1,96,970
Old maintenance charges for works for which Capital and Revenue Accounts are kept	6,436	...	6,436	...	...	6,436
Total ...	4,03,883	...	4,03,883	...	...	4,03,883
AGRICULTURAL WORKS.						
Major Works	1,52,482	...	1,52,482	...	...	1,52,482
Minor Works	18,000	...	18,000	...	...	18,000
Total ...	1,70,482	...	1,70,482	...	...	1,70,482
Total, Imperial ...	5,77,845	...	5,77,845	...	...	5,77,845

GOVERNMENT OF MADRAS.

PART II—continued.

GENERAL ABSTRACT OF THE GRANT PROVIDED FOR IN THE PRECEDING ESTIMATE.

—	Imperial Funds.			Contribution.	Provincial Funds.	Total.
	In India.	In England.	Total.			
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE—continued.						
44. IRRIGATION AND NAVIGATION—continued.						
PROVINCIAL.						
IRRIGATION AND NAVIGATION WORKS. CAPITAL ACCOUNT.						
Buckingham Canal	...	...	...	...	1,50,406	1,50,406
Madras Water Supply and Irrigation Extension Project ...	...	...	...	...	19,150	19,150
Total ...	...	...	...	...	1,69,556	1,69,556
REVENUE ACCOUNT.						
Buckingham Canal	...	...	...	...	5,000	5,000
Total ...	...	...	...	...	5,000	5,000
F. FAMINE RELIEF AND INSURANCE.						
34. PROTECTIVE WORKS—IRRIGATION.						
Imperial.						
CAPITAL ACCOUNT.						
Rushikulya Project	2,00,000	...	2,00,000	...	...	2,00,000
Minor Original Works	1,50,000	...	1,50,000	...	...	1,50,000
Total ...	3,50,000	...	3,50,000	...	...	3,50,000

GOVERNMENT OF MADRAS.

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PART III.

DETAIL OF THE BUDGET ESTIMATE FOR MAINTENANCE AND REPAIRS OF IRRIGATION WORKS FOR THE YEAR 1884-85.

—	Estimate, 1884-85.		Estimate, 1883-84.	
	Amount.	Total.	Amount.	Total.
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.	Rs.	Rs.
44. IRRIGATION AND NAVIGATION–IMPERIAL.				
MAINTENANCE AND REPAIRS.				
Chembrambakam Tank—				
Chingleput division	3,500		3,500	
Deduct old maintenance charges	3,097		3,097	
	...	403	...	403
Pálár Anicut System—				
Northern Section—				
Kávéripak channel	3,000		3,000	
Do. Tank supply channel	4,000		4,000	
Mahindravadi channel	3,000		3,000	
Govindavadi channel	5,000		5,000	
Southern Section—				
Dusi channel	2,500		2,500	
Chuckramallur channel	2,500		2,500	
	20,000		20,000	
Deduct old maintenance charges	2,909		2,909	
	...	17,091	...	17,091
Pelandorai Anicut System—				
South Arcot division	8,000		6,000	
Deduct old maintenance charges	58		58	
	...	7,942	...	5,942
Total ...	...	25,436	...	23,336
Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept	5,50,000		5,50,000	
Old Maintenance Charges	1,30,766		1,30,766	
Repairs to Minor Irrigation Works	3,70,000	10,50,766	3,70,000	10,50,766
Agricultural Works—				
River Conservancy	64,000		67,155	
River Embankments	80,000		80,845	
Drainages	1,000		...	
Miscellaneous	...		2,000	
Reserve	5,000	1,50,000	...	1,50,000
Total, Imperial ...	...	12,26,202	...	12,24,102
PROVINCIAL.				
Maintenance and Repairs—				
Maintenance of Buckingham canal—				
61 miles at Rs. 110 per mile	6,710		6,710	
207 „ at Rs. 275 „	56,925		56,925	
Repairs to masonry works	5,000	68,635	5,100	68,735
Maintenance of the Madras Water Supply and Irrigation Extension Project Works	9,024	9,024	8,675	8,675
Total, Provincial ...	...	77,659	...	77,410

GOVERNMENT OF MADRAS.

PART III—continued.

GENERAL ABSTRACT OF THE GRANTS PROVIDED FOR IN THE PRECEDING ESTIMATE.

—	Imperial Funds.			Contribution.	Provincial Funds.	Total.
	In India.	In England.	Total.			
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE						
44. IRRIGATION AND NAVIGATION—IMPERIAL						
Revenue.						
Chembrambakam Tank	403	...	403	...	...	403
Pelandorai Anicut System	7,942	...	7,942	...	...	7,942
Pálár Anicut System	17,091	...	17,091	...	...	17,091
Total ...	25,436	...	25,436	...	...	25,436
Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept	10,50,766	...	10,50,766	...	...	10,50,766
Agricultural Works—						
River conservancy	64,000	...	64,000	...	...	64,000
River embankments	80,000	...	80,000	...	...	80,000
Drainages	1,000	...	1,000	...	...	1,000
Miscellaneous	...	...	...	...	...	...
Reserve	5,000	...	5,000	...	...	5,000
Total ...	1,50,000	...	1,50,000	...	...	1,50,000
Total, Imperial ...	12,26,202	...	12,26,202	...	...	12,26,202
PROVINCIAL.						
Buckingham Canal	...	...	...	...	68,635	68,635
Madras Water Supply and Irrigation Extension Project Works	...	...	...	...	9,024	9,024
Total, Provincial ...	...	...	...	...	77,659	77,659

GOVERNMENT OF MADRAS.

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PART IV.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT CHARGES FOR THE YEAR 1884-85.

Number.		Particulars.	Rate of Salary.	Budget Estimate for 1884-85.			Revised Estimate for 1883-84.
1883-84.	1884-85.			Per Mensem.	Per Annum.	Total.	
1	2	3	4	5	6	7	8
			Rs.	Rs.	Rs.	Rs.	Rs.
		IMPERIAL.					
		H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.					
		44. IRRIGATION AND NAVIGATION.					
		Total Grant for Works and Repairs	...	...	...	18,04,047	17,23,854
		Deduct items on which no Establishment charge is admissible—					
		Grant for Land Compensation	...	...	...	...	13,289
		Grant for Expenditure in the Tank Division, in which the cost of actual Establishment employed is debited to Irrigation	...	...	...	1,96,970	12,000
		Grant for Repairs to Minor Irrigation Works under the charge of Collectors	...	...	...	3,70,000	3,70,000
		Total Deductions ...	...	...	...	5,66,970	3,95,289
		Net Grant for Works and Repairs ...	...	...	...	12,37,077	13,28,565
		A. Contribution to Provincial Funds on account of Establishment at 23 per cent. on the grant for Works and Repairs	...	...	...	2,84,528	3,05,581
		Estimate of Direct Revenue ...	...	...	...	22,650	22,420
		B. Contribution to Provincial Funds at 10 per cent. of the estimate of Direct Revenue ...	...	...	...	2,265	2,242
		Revenue due to old Irrigation under Productive Public Works	...	...	...	27,44,000	27,44,000
		C. 6 per cent. on revenue due to old irrigation	...	...	...	1,64,640	1,64,640
		Total A + B + C ...	...	...	...	4,51,433	4,72,441
		Special Establishment for improving Tanks.					
1	1	Superintending Engineer, 3rd Grade	1,593⅓	1,593⅓			
1	1	Executive Engineer, 3rd Grade	650	650			
		Total ...	...	2,243⅓			
		Office Establishment.					
1	1	Clerk, 2nd Class, 1st Grade	180	180			
1	1	Do. 3rd do. 3rd do.	55	55			
1	1	Do. 4th do. 2nd do.	35	35			
1	1	Do. 4th do. 3rd do.	25	25			
1	1	Draughtsman, Special	90	90			
1	1	Do. 1st Class	60	60			
2	2	Do. 2nd Class	42½	85			
1	1	Moochee	8	8			

GOVERNMENT OF MADRAS.

PART IV—continued.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT CHARGES FOR THE YEAR 1884-85—continued.

Number. 1883-84.	Number. 1884-85.	Particulars.	Rate of Salary.	Budget Estimate for 1884-85. Per Mensem.	Budget Estimate for 1884-85. Per Annum.	Budget Estimate for 1884-85. Total.	Revised Estimate for 1883-84.
1	2	3	4	5	6	7	8
			Rs.	Rs.	Rs.	Rs.	Rs.
		IMPERIAL—continued.					
		H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE—continued.					
		44. IRRIGATION AND NAVIGATION—continued.					
		Imperial—continued.					
		Office Establishment—cont.					
3	3	Messengers	6	18			
3	3	Lascars	6	18			
		Total, Office Establishment ...	...	574			
		Total ...	...	2,817½	33,810		
		Travelling Allowance	...	...	1,620		
		Contingencies	...	...	1,200		
						36,630	
		Establishment for No. 1 Tank Division.					
1	1	Executive Engineer, 3rd Grade	650	650			
1	1	Assistant Engineer, 1st do.	450	450			
1	1	Sub-Engineer, 2nd do.	300	300			
1	1	Supervisor, 2nd do.	150	150			
4	4	Overseers, 2nd do.	80	320			
			...	1,870			
		Office Establishment.					
1	1	Clerk, 3rd Class, 2nd Grade	70	70			
1	1	Do. 4th do. 1st do.	45	45			
1	1	Do. 4th do. 2nd do.	35	35			
2	2	Clerks, 4th do. 3rd do.	25	50			
1	1	Draughtsman, 1st Class	60	60			
1	1	Do. 3rd do.	25	25			
1	1	Messenger	7	7			
1	1	Do.	6	6			
3	3	Lascars	6	18			
			...	316			
		Sub-Divisional Office Establishment.					
3	3	Clerks, 4th Class, 3rd Grade	25	75			
3	3	Messengers	6	18			
				93			
		Total No. 1 Tank Division ...	...	2,279	27,348		
		Travelling Allowance	...	...	3,452		
		Contingencies	...	...	1,200		
						32,000	
		No. 2 Tank Division as above	...	...	...	32,000	
		Total ...	...	...	...	1,00,630	51,255
		Total H. Expenditure on Public Works not classed as Productive ...	...	...	...	5,52,063	5,23,696

GOVERNMENT OF MADRAS.

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PART IV—continued.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT CHARGES FOR THE YEAR 1884-85—*continued.*

Number.		Particulars.	Rate of Salary.	Budget Estimate for 1884-85.			Revised Estimate for 1883-84.
1883-84.	1884-85.			Per Mensem.	Per Annum.	Total.	
1	2	3	4	5	6	7	8
				Rs.	Rs.	Rs.	Rs.
		F. FAMINE RELIEF AND INSURANCE.					
		34. PROTECTIVE WORKS—IRRIGATION.					
		Total Grant for Works	...	...	...	3,50,000	1,36,661
		Deduct items on which no charge for Establishment is admissible.					
		Compensation for land	...	...	...	...	...
		Grant for expenditure in the Project Divisions in which the cost of Establishment employed is debited to Irrigation	...	...	...	...	3,661
		Grant-in-aid for the Buckingham Canal	...	...	...	1,50,000	1,33,000
		Total Deductions ...	...	...	...	1,50,000	1,36,661
		Net Grant ...	...	...	...	2,00,000	...
		Contribution to Provincial Funds at 23 per cent. on the net Grant	...	...	...	46,000	...
		Establishment in the Project Divisions	...	...	...	...	39,208
		Total ...	...	...	...	46,000	39,208
		PROVINCIAL.					
		H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.					
		44. IRRIGATION AND NAVIGATION.					
		Grant for Works and Repairs	...	...	...	2,52,215	2,50,763
		Share of the Public Works Establishment charges at 23 per cent. on the grant for Works and Repairs	...	...	...	58,011	57,676
		Estimate of Direct Revenue	...	...	...	39,060	72,580
		Share of the Public Works Establishment charges at 10 per cent. on Direct Revenue	...	...	...	3,906	7,258
		Share of the Public Works Establishment charges at 23 per cent. on the grant-in-aid from F. Famine Relief and Insurance Funds	...	...	...	34,500	30,590
		Total, Establishment Charges ...	...	...	...	96,417	95,524

GOVERNMENT OF MADRAS.

PART V.

DETAIL OF ESTIMATED CHARGES FOR ESTABLISHMENT BY SYSTEMS OF CANALS FOR 1884-85.

—	Percentage on the Grant for Works and Repairs.		Percentage on the Direct Revenue.		Percentage on the Indirect Revenue.		Cost of Establishment Actually Employed.	Total Charges for Establishment.
	Grant for Works and Repairs.	23 per cent.	Direct Revenue.	10 per cent.	Indirect Revenue.	6 per cent.		
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
44. IRRIGATION AND NAVIGATION—IMPERIAL.								
Works for which Capital and Revenue Accounts are kept.								
CAPITAL ACCOUNT.								
Nil.								
REVENUE ACCOUNT.								
Chembrambakam Tank	— 880	— 202	50	5	...	...	...	— 197
Pálár Anicut System	20,913	4,810	550	55	...	...	...	4,865
Pelandorai Anicut System	8,883	2,043	50	5	...	...	...	2,048
Total ...	28,916	6,651	650	65	...	...	...	6,716
Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept	7,50,477	1,72,610	12,000	1,200	...	...	...	1,73,810
Old Maintenance Charges	1,37,202	31,556	...	...	27,44,000	1,64,640	...	1,96,196
Tank Maintenance Scheme	...	...	...	...	...	...	1,00,630	1,00,630
Agricultural Works	3,20,482	73,711	10,000	1,000	...	...	...	74,711
Total ...	14,05,131	2,77,877	22,000	2,200	27,44,000	1,64,640	1,00,630	5,45,347
Total, Imperial ...	12,37,077	2,84,528	22,650	2,265	27,44,000	1,64,640	1,00,630	5,52,063
PROVINCIAL.								
CAPITAL ACCOUNT.								
Buckingham Canal	1,50,406	69,094	...	...	...	...	...	69,094
Madras Water-supply and Irrigation Extension Project	19,150	4,405	...	...	...	...	...	4,405
Total ...	1,69,556	73,499	...	...	...	...	...	73,499
REVENUE ACCOUNT.								
Buckingham Canal	73,635	16,936	33,100	3,310	...	...	...	20,246
Madras Water-supply and Irrigation Extension Project	9,024	2,076	5,960	596	...	...	...	2,672
Total ...	82,659	19,012	39,060	3,906	...	...	...	22,918
Total, Provincial ...	2,52,215	92,511	39,060	3,906	...	...	...	96,417
F. FAMINE RELIEF AND INSURANCE.								
34. PROTECTIVE WORKS—IRRIGATION.								
Imperial.								
CAPITAL ACCOUNT.								
Rushikulya Project	2,00,000	46,000	...	...	...	...	...	46,000
Total ...	2,00,000	46,000	...	...	...	...	...	46,000

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GOVERNMENT OF MADRAS.

PART VI.

DETAIL OF THE BUDGET ESTIMATE FOR EXPENDITURE ON TOOLS AND PLANT FOR THE YEAR 1884-85.

—	Estimate, 1884-85.	Estimate, 1883-84.
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.
44. IRRIGATION AND NAVIGATION.		
Imperial.		
Irrigation and Navigation Works for which Capital and Revenue Accounts are kept.		
Capital.		
Nil.		
Revenue.		
Tools and Plant, &c.	368	...
Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept.		
Survey instruments, &c., required for Tank Divisions {No. 1 Tank Division 400; No. 2 do. 2,000}	2,400	2,400
General Tools and Plant at 1½ per cent. on the grant for Works and Repairs ...	11,257	} 17,528
General Tools and Plant at 1½ per cent. on the grant for Works and Repairs on Old Maintenance Charges	2,058	
Agricultural Works.		
General Tools and Plant at 1½ per cent. on the grant for Works and Repairs ...	4,807	
Total, Imperial ...	20,890	19,928
Provincial.		
Capital—Tools and Plant, &c.	500	...
Revenue— do.	1,368	...
General Tools and Plant at 1½ per cent. on the grant for Works and Repairs ...	...	4,061
Total, Provincial ...	1,868	4,061
F. FAMINE RELIEF AND INSURANCE.		
34. PROTECTIVE WORKS, IRRIGATION.		
IMPERIAL.		
Machinery, &c., required for the Rushikulya Project	3,000	11,750
General Tools and Plant on the grant for Works and Repairs	...	750
Total, Protective ...	3,000	12,500
Grand Total ...	25,758	36,489

GOVERNMENT OF MADRAS.

PART VI-A.

DETAIL OF ESTIMATED TOOLS AND PLANT CHARGES BY SYSTEMS OF CANALS FOR 1884-85.

—	Special Tools and Plant.	General Tools and Plant.	Total.	Grant for Works and Repairs.
H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.	Rs.	Rs.	Rs.	Rs.
44. IRRIGATION AND NAVIGATION IMPERIAL.				
Capital.				
Nil.				
Revenue.				
Chembrambakam Tank	77	...	77	— 880
Pálár Anicut System	222	...	222	20,913
Pelandorai Anicut System	69	...	69	8,883
Total ...	368	...	368	28,916
Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept	...	11,257	11,257	7,50,477
Tank Maintenance Scheme	2,400	...	2,400	1,96,,970
Old Maintenance Charges	...	2,058	2,058	1,37,202
Agricultural Works	...	4,807	4,807	3,20,482
Total, Imperial ...	2,768	18,122	20,890	4,03,883
PROVINCIAL.				
Capital.				
Buckingham Canal	500	...	500	1,50,406
Madras Water-supply and Irrigation Extension Project ...	...	...	...	19,150
Total ...	500	...	500	1,69,556
Revenue Account.				
Buckingham Canal	1,119	...	1,119	73,635
Madras Water-supply and Irrigation Extension Project ...	249	...	249	9,024
Total ...	1,368	...	1,368	82,659
Total, Provincial ...	1,868	...	1,868	2,52,215
F. FAMINE RELIEF AND INSURANCE.				
34. PROTECTIVE WORKS—IRRIGATION. IMPERIAL.				
Rushikulya Project	3,000	...	3,000	2,00,000
Total ...	...	...	...	...

PART VII.

ABSTRACT OF THE PROBABLE INCREASE OR DECREASE IN THE SUSPENSE ACCOUNTS OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR 1884-85.

None.

All suspense accounts are treated as Provincial.

GOVERNMENT OF MADRAS.

APPENDIX A.

ACTUAL AND ESTIMATED CAPITAL ACCOUNT OF IRRIGATION AND NAVIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1884-85.

—	Direct Charges.	Indirect Charges.				Grand Total.
		Capitalization of abatement of Land Revenue.	Exchange on Payments in England.	Leave and Pension Allowances.	Total.	
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
IMPERIAL.						
CHEMBRAMBAKAM TANK.						
Actual outlay to end of 1882-83.	6,24,425	85,701	...	26,463	1,12,164	7,36,589
Probable outlay during 1883-84.	...	...	...	...	...	...
Proposed outlay during 1884-85.	...	...	...	...	...	...
Total ...	6,24,425	85,701	...	26,463	1,12,164	7,36,589
PELANDORAI ANICUT SYSTEM.						
Actual outlay to end of 1882-83.	3,53,542	20,004	...	13,482	33,486	3,87,028
Probable outlay during 1883-84.	3,289	4,111	...	...	4,111	7,400
Proposed outlay during 1884-85.	...	...	...	...	...	...
Total ...	3,56,831	24,115	...	13,482	37,597	3,94,428
PALAR ANICUT SYSTEM.						
Actual outlay to end of 1882-83.	15,92,004	16,217	...	72,744	88,961	16,80,965
Probable outlay during 1883-84.	...	...	...	...	...	...
Proposed outlay during 1884-85.	...	...	...	...	...	...
Total ...	15,92,004	16,217	...	72,744	88,961	16,80,965
Total, Imperial ...	25,73,260	1,26,033	...	1,12,689	2,38,722	28,11,982
PROVINCIAL.						
BUCKINGHAM CANAL.						
Actual outlay to end of 1882-83.	48,92,525	3,46,527	...	1,35,447	4,81,974	53,74,499
Probable outlay during 1883-84.	1,40,973	...	...	6,819	6,819	1,47,792
Proposed outlay during 1884-85.	2,20,000	...	...	9,673	9,673	2,29,673
Total ...	52,53,498	3,46,527	...	1,51,939	4,98,466	57,51,964
MADRAS WATER-SUPPLY AND IRRIGATION EXTENSION PROJECT.						
Actual outlay to end of 1882-83.	14,72,958	2,08,056	...	28,983	2,37,039	17,09,997
Probable outlay during 1883-84.	42,920	...	...	1,124	1,124	44,044
Proposed outlay during 1884-85.	23,555	...	...	617	617	24,172
Total ...	15,39,433	2,08,056	...	30,724	2,38,780	17,78,213
Total, Provincial Works ...	67,92,931	5,54,583	...	1,82,663	7,37,246	75,30,177

GOVERNMENT OF MADRAS.

APPENDIX B.

ACTUAL AND ESTIMATED REVENUE ACCOUNT OF IRRIGATION AND NAVIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF 1884-85.

—	Revenue Receipts, 1884-85.			Probable Expenses during 1884-85, including Indirect Charges.	Balance, Surplus or Deficit, 1884-85.	Probable Net Surplus or Deficit for 1883-84.	Actual Net Surplus or Deficit to end of 1882-83.	Probable Net Surplus or Deficit to end of 1884-85.
	Direct Receipts.	Indirect Receipts.	Total.					
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
IMPERIAL.								
Chembrambakam Tank ...	50	33,037	33,087	—1,140	34,227	20,437	2,65,672	3,20,336
Pelandorai Anicut System ...	50	6,589	6,639	11,287	—4,648	—24,420	—1,95,868	—2,24,936
Pálár Anicut System ...	550	1,07,184	1,07,734	26,681	81,053	73,660	5,81,755	7,36,468
Total ...	650	1,46,810	1,47,460	36,828	1,10,632	69,677	6,51,559	8,31,868
PROVINCIAL.								
Buckingham Canal	33,100	...	33,100	97,834	—64,734	—1,25,348	5,28,422	3,38,340
Madras Water-supply and Irrigation Extension Project ...	5,960	9,837	15,797	12,319	3,478	25,334	— 5,852	22,960
Total ...	39,060	9,837	48,897	1,10,153	—61,256	—1,00,014	5,22,570	3,61,300

APPENDIX C.

ACTUAL AND ESTIMATED INTEREST ACCOUNT OF IRRIGATION AND NAVIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF 1884-85.

—	Actual Charges for Interest to end of 1882-83.	Probable Charges for Interest for 1883-84.	Probable Charges for Interest for 1884-85.	Total to end of 1884-85.	Net Surplus or Deficit from Appendix B.	Balance of Interest Charge remaining unpaid.
1	2	3	4	5	6	7
IMPERIAL.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Chembrambakam Tank	2,86,128	24,977	24,977	3,36,082	3,20,336	15,746
Pelandorai Anicut System	99,205	14,206	14,271	1,27,682	—2,24,936	3,52,618
Pálár Anicut System	13,71,171	63,680	63,680	14,98,531	7,36,468	7,62,063
Total ...	17,56,504	1,02,863	1,02,928	19,62,295	8,31,868	11,30,427
PROVINCIAL.						
Buckingham Canal	18,90,504	1,98,510	2,05,739	22,94,753	3,38,340	19,56,413
Madras Water-supply and Irrigation Extension Project	8,40,719	59,776	61,105	9,61,600	22,960	9,38,640
Total ...	27,31,223	2,58,286	2,66,844	32,56,353	3,61,300	28,95,053

GOVERNMENT OF MADRAS.

APPENDIX D.

ESTIMATED ACCOUNT OF RECEIPTS AND CHARGES OF THE IRRIGATION BRANCH, PUBLIC WORKS DEPARTMENT, IN THE MADRAS PRESIDENCY FOR THE YEARS 1883-84 AND 1884-85.

RECEIPTS.

ACCOUNTS.	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.
	Rs.	Rs.
To Balance at commencement of year	...	...
To Transfers of the Public Works Department—		
Buildings and Roads Branch	60,27,090	53,01,247
To Imperial Fund Receipts—		
G. Revenue from Productive Public Works.		
XXVII—Irrigation and Navigation (Direct Receipts)	1,49,400	1,47,560
H. Receipts on account of Public Works not classed as Productive.		
XXXI—Irrigation and Navigation	22,650	22,420
To Provincial Fund Receipts—		
H. Receipts on account of Public Works not classed as Productive.		
XXXI—Irrigation and Navigation	39,060	72,580
Total ...	62,38,200	55,43,807

CHARGES.

ACCOUNTS.	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.
	Rs.	Rs.
By Transfers of the Public Works Department—		
Buildings and Roads Branch	2,11,110	2,42,560
By Imperial Fund Expenditure	...	...
F. Famine Relief and Insurance.		
34 Protective Works, Irrigation	3,99,000	1,79,191
G. Expenditure on Productive Public Works (Revenue Account).		
[illegible]gation and Navigation (working expenses)	9,20,590	9,02,409
H. [illegible]ure on Public Works not classed as Productive.		
[illegible]tion and Navigation (Expenditure in India)	23,77,000	22,73,401
By [illegible] Fund Expenditure—		
H. [illegible]e on Public Works not classed as Productive.		
[illegible]ation and Navigation	3,50,500	3,48,893
N. [illegible]re on Productive Public Works, Capital Account.		
[illegible]ation and Navigation	19,80,000	15,97,353
By B[illegible] the end of year	...	...
Total ...	62,38,200	55,43,807

MADRAS,
April 1884.

(Signed) D. C. GORDON,
Examiner of Public Works Accounts.

GOVERNMENT OF MADRAS.

SCHEDULE A.—SHOWING THE COMPONENT WORKS OF THE BUDGET ITEMS FOR 1884-85.

Item No.	Main-head.	Name of Canals.	Sub-head.	Individual Work.	Amount of Estimate.	Outlay To end of 1882-83.	Outlay Probable during 1883-84.	Grant, 1884-85.	Item No.
					Rs.	Rs.	Rs.	Rs.	Rs.
		H. EXPENDITURE ON PUBLIC WORKS NOT CLASSED AS PRODUCTIVE.							
		44. IRRIGATION AND NAVIGATION.							
		CAPITAL ACCOUNT.							
		Provincial.							
		Madras Water-Supply and Irrigation Extension Project.							
	...	Cholaveram Tank Supply Channel.	...	Distributing Channels.	27,201	...	...	19,150	19,150

GOVERNMENT OF MADRAS.

SCHEDULE B.—SHOWING THE DISTRIBUTION OF GRANTS FOR MINOR ORIGINAL WORKS FOR 1884-85 BY DIVISIONS.

Divisions.	Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept.		Agricultural Works. River Conservancy.		River Embankment.		Drainage.		Miscellaneous.		Total.	
	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ganjam	10,000	5,000	...	...	...	...	...	...	...	...	...	...
Vizagapatam	1,500	1,500	...	...	...	...	...	...	...	...	...	...
Godávari, Eastern	5,000	3,000	500	...	500	...	...	...	400	400	1,400	400
Do. Western	2,000	2,000	...	...	...	...	...	...	...	[illegible]	...	500
Kistna, Eastern	1,500	1,500	...	...	...	...	...	1,000	...	500	...	1,500
Do. Western	...	...	...	500	...	...	...	...	...	...	...	500
Nellore	10,000	10,000	500	500	500	500	...	...	...	100	1,000	1,100
Bellary	1,500	1,500	...	...	...	...	...	...	...	...	...	...
Cuddapah	3,000	3,000	...	...	...	...	...	...	...	...	...	...
Kurnool	2,000	2,000	...	...	...	...	...	...	...	...	...	...
Coimbatore	7,000	7,000	1,000	1,000	1,000	1,000	...	...	500	500	2,500	2,500
Salem	2,500	2,500	...	...	...	...	...	...	350	200	350	200
North Arcot	12,000	6,000	...	...	...	...	...	...	...	...	...	...
South Arcot	12,000	13,000	...	...	...	...	...	...	300	400	300	400
Chingleput	15,000	15,000	1,000	...	...	...	...	...	...	...	1,000	...
Presidency	...	...	...	...	...	...	...	...	...	...	...	...
Trichinopoly	4,000	8,000	2,000	2,000	3,000	3,000	1,000	1,000	...	...	6,000	6,000
Tanjore	1,000	1,000	...	200	1,000	2,000	500	1,000	...	500	1,500	3,700
Negapatam	3,000	2,000	...	500	...	1,500	...	300	...	100	...	2,400
Madura	7,000	7,000	...	...	...	...	...	...	...	...	...	...
Tinnevelly	6,000	6,000	...	...	2,000	2,000	...	...	...	...	2,000	2,000
Total ...	1,06,000	97,000	5,000	4,700	8,000	10,000	1,500	3,300	1,550	3,200	16,050	21,200
Reserve ...	14,479	28,000	...	...	...	...	...	...	...	...	1,950	...
	...	...	...	...	...	...	...	...	...	...	...	3,100
Grand Total ...	1,20,479	1,25,000	...		...	...	...	...	...	...	18,000	24,300

GOVERN[MEN]T OF MADRAS.

SCHEDULE C.—SHOWING THE DISTRIBUTION OF GRANTS FOR REPAIRS TO IRRI[GATI]ON AND NAVIGATION AND AGRICULTURAL WORKS FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUN[TS] ARE KEPT FOR 1884-85.

Divisions.	Irrigation and Navigation.		River Conservancy.		Agricultural Works. River Embankment.		Drainage.		Miscellaneous.		Total.	
	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ganjam	20,000	20,000	[illegible]	[illegible]	...	1,000	...	...	...	...	...	1,000
Visagapatam ...	7,000	7,000	500	[illegible]	...	...	...	...	...	...	500	500
Godávari, Eastern ...	7,000	5,000	7,000	[illegible]	4,500	3,000	...	...	...	...	11,500	8,000
Do. Central ...	...	[illegible]	5,000	[illegible]	2,500	1,000	...	...	...	...	7,500	6,000
Do. Western ...	4,000	[illegible]	5,000	[illegible]	2,000	1,000	...	...	...	...	7,000	8,000
Kistna, Eastern ...	5,000	7,0[illegible]	1,000	[illegible]	9,000	10,000	...	...	...	...	10,000	11,000
Do. Western ...	...	...	1,000	[illegible]	2,000	4,000	...	...	...	...	3,000	5,000
Nellore	45,000	[illegible],000	500	[illegible]	1,000	1,000	...	...	...	...	1,500	1,500
Bellary	25,000	33,[illegible]	...	[illegible]	...	...	...	...	...	...	...	...
Cuddapah	25,000	18,0[illegible]	1,500	[illegible]	1,000	400	...	...	...	...	2,500	2,155
Kurnool	10,000	10,000	[illegible]	[illegible]	...	...	...	...	...	...	...	...
West Coast	...	...	[illegible]	[illegible]	...	...	...	...	...	...	...	...
Coimbatore	40,000	37,000	[illegible],000	[illegible]	2,000	2,000	...	...	...	...	10,000	10,000
Salem	15,000	12,500	500	[illegible]	...	...	...	...	...	...	500	400
North Arcot	30,000	25,000	...	[illegible]	...	...	...	...	...	...	...	...
South Arcot	80,000	80,000	5,000	[illegible]	2,000	2,000	...	...	...	...	7,000	10,000
Chingleput	60,000	60,000	...	[illegible]	2,000	500	...	...	...	...	2,000	500
Presidency	1,000	1,000	...	[illegible]	...	...	...	...	...	...	...	...
Trichinopoly	40,000	49,000	7,000	[illegible]	11,000	11,000	500	...	...	...	18,500	18,000
Tanjore	3,000	2,200	16,000	[illegible]	23,000	22,200	500	500	...	...	39,500	38,700
Negapatam	5,000	5,400	6,000	[illegible]	15,000	15,000	...	500	...	...	21,000	21,500
Madura	30,000	32,700	...	[illegible]	...	...	...	...	...	...	...	...
Tinnevelly	70,000	70,000	...	[illegible]	3,000	3,000	...	...	...	...	3,000	3,000
Total ...	5,22,000	5,19,800	64,000	[illegible]5	80,000	77,100	1,000	1,000	...	...	1,45,000	1,45,255
Reserve ...	28,000	30,200	...	[illegible]	...	...	...	...	...	...	5,000	4,745
Total ...	5,50,000	5,50,000	...	[illegible]	...	...	...	...	...	...	1,50,000	1,50,000
Minor Irrigation Works in charge of the Revenue Department	* 3,70,000	3,70,000	...	[illegible]	...	...	...	...	...	...	...	...
Grand Total ...	9,2[illegible],000	9,20,000	...	[illegible]	...	...	...	...	...	...	1,50,000	1,50,000

* Ganjam 15,000
Vizagapatam .. 4,000
Godávari 8,000
Kistna .. .. [illegible]
Nellore [illegible]
Cuddapah [illegible]
Kurnool [illegible]
[illegible] 4,000
[illegible] 8,500
[illegible]r 20,000
[illegible]t 15,000
[illegible]cot .. 40,000
[illegible]cot .. 18,000
[illegible] 5,000
[illegible]ore .. ..
Tanjore 12,000
Trichinopoly .. 6,000
Madura 15,000
Tinnevelly 15,000
Reserve 92,500

Total .. 3,70,000

13TH MAY 1884, No. 637, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Secretary to Government, Revenue Department (through the Accountant-General), dated Madras, 3rd April 1884, No. 1064-42:—

I have the honor to submit, herewith, a proposition statement for a modification of, and slight increase to the establishment now employed on the investigation of titles to, and the demarcation of escheats in the Wynaad.

2. In the scheme sanctioned in G.O., No. 791, dated 29th June 1883, fixed batta at varying rates was provided for the clerks; but in the similar case of the Nílgiri settlement party the Accountant-General pointed out, after the scheme was submitted from this office, that fixed batta could not be drawn under the provisions of the new Travelling Allowance Code.

3. It becomes necessary therefore to re-adjust the salaries of the clerks, and at the suggestion of Mr. Stuart, the officer in charge of the party, I take the opportunity of proposing a slight re-arrangement of the salaries.

4. To the head clerk, who, under the scheme as sanctioned, should draw with the disallowed fixed batta Rs. 97-8-0, I assign Rs. 100, and to the second clerk, who with batta should draw Rs. 65, I give Rs. 60.

Travelling allowances will not be claimable by these officers.

Instead of a masaljee on Rs. 10, who is not separately wanted, I propose a moochee, who is, on Rs.12. The pay of the peons, Rs. 60, I propose to raise to Rs. 62 by giving one of them Rs. 2 extra as head peon.

5. The cost of this re-arrangement is Rs. 234-0-0, or Rs. 1½ a-month more than the sanctioned scale.

6. I have provided also for the pay, Rs. 40, of a 2nd-class hospital assistant.

Mr. Stuart states that the establishment may be at times far from station medical aid and in very unhealthy parts of the country, and asks for the services of an hospital assistant for 6 months in the year, viz., from the beginning of September till the end of February, the period, that is, during which only field operations are possible in the Wynaad. I beg to commend Mr. Stuart's request to the very favorable consideration of the Government.

7. With the addition of the pay of an hospital assistant the increase now asked for is Rs. 41-8-0 a-month. The additional charge can be met from the budget provision for field establishments that have not been entertained.

ORDER—dated 13th May 1884, No. 637, Revenue.

Miscellaneous.

The proposed modification and increase of establishment are sanctioned.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement.
,, Accountant-General.
,, Public Department.
,, Board of Revenue.

Exd. E. Fernandez.

80 Copies.

In No 1607/84

Govt. of {1884} Madras.

REVENUE.

No 1753/97

Issued

Recd. Encl

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre. Madras, 3 1/4 June 1884 (By order) [signature] 1st. Assistant

To The Dy: Director, Party No III

G.O., 13th May 1884, No. 637.

MAY.

Wynaad Escheats

The modification of, and increase to the establishment entertained for the investigation and settlement of — sanctioned as proposed by the Director of Revenue Settlement.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 7th April 1884, No. 1258:—

Read—the following G.O., dated 21st February 1884, No. 251, Revenue:—

Abstract.—Making a reduction of two and a half lakhs in Budget Estimates of Charges for 1884-85.

Resolution—dated 7th April 1884, No. 1258.

With reference to paragraphs 2 and 5 of the Government Order read above, the Board beg to observe that the reduced allotment for Land-revenue temporary establishments for 1884-85 will be Rs. 26,400 only, an amount which will be inadequate to meet the cost of the establishments already sanctioned as shown below:—

(*a*) *Establishments for surveying Unassessed Waste Lands.*—A provision of Rs. 864 for Godávari and of Rs. 2,880 for Kistna has been made in the Board's budget. Of the latter amount, Rs. 2,052 have to be transferred to the head Permanent Establishment and Rs. 252 are required for Temporary Establishment (*vide* G.O., dated 20th December 1883, No. 1601, Revenue Department, and Board's Proceedings, dated 25th March 1884, Mis. No. 2679). The saving that can be effected under this head is only Rs. 576.

(*b*) *Establishment for arranging Records.*—The Board's provision under this head was Rs. 23,000. In G.Os., dated 26th November 1883, No. 1464, Revenue Department, and 21st January 1884, No. 98, Revenue Department, Government have sanctioned establishments costing Rs. 2,940 per annum. The Board would, therefore, retain Rs. 3,000 in round numbers under this head.

(*c*) *Zilladars in North Arcot.*—The expenditure provided for this purpose was sanctioned in G.O., dated 8th October 1872, No. 1399, Revenue Department, pending the revision of village establishments and will be required in 1884-85, as the revision has only just been commenced.

(*d*) *Establishment for Assistant Collectors.*—The Board are of opinion that no reduction should be made in the provision of Rs. 18,000 on this account.

(*e*) *Escheat Establishment in Malabar.*—Of the sum of Rs. 2,810 provided under this head, Rs. 2,568 are required (*vide* Board's Proceedings, dated 28th March 1884, Mis. No. 2791).

(*f*) *Establishment for Special Assistant Collector, Godávari.*—The cost provided on this account, viz., Rs. 1,956, cannot be reduced.

(*g*) *Demarcation Establishment in Nellore.*—The amount provided in the budget was only Rs. 1,250, but under G.O., dated 21st November 1883, No. 1439, Revenue Department, the provision has now to be raised to Rs. 2,196.

(*h*) *Rámandrug Sub-Magistrate and his Establishment.*—It is not known whether troops will be sent to Rámandrug during 1884-85; if not, the provision of Rs. 496 will be unnecessary (*vide* G.O., dated 23rd July 1880, No. 1768, Judicial Department).

(*i*) *Establishment for measuring irrigated Lands in Nidadavól and Baharzalli.*—No change can be made in the provision of Rs. 1,200 under this head, pending the Collector's reply to Board's Proceedings, dated 16th November 1883, Mis. No. 9525.

(*j*) *to* (*l*) *and* (*n*) *to* (*q*). The establishments referred to in these clauses (paragraph 17 of Board's budget) will be required during 1884-85.

(*m*) *Establishment for preparing Land Registers in Madras.*—Rs. 780 provided on this account will be necessary with reference to paragraph 2 of the Deputy Collector's letter, dated 26th October 1883, No. 891, recorded in G.O., dated 24th December 1883, No. 1623, Revenue Department, and the amount of work remaining to be done is shown in the Progress report for February 1884.

2. The total amount required for the establishments above detailed, excluding that for Rámandrug, will thus be Rs. 38,606. To this must be added the cost of the establishments sanctioned subsequent to the submission of the Board's budget, viz:—

	RS.
Additional establishment for the Anantapur Head Assistant—G.O., dated 1st December 1883, No. 4793, Revenue Department, ...	600
Treasurer and Accountant for Nílgiris—G.Os., dated 13th and 17th November 1883, No. 2556, Financial Department, and No. 4602, Revenue Department	1,140
Shroff for Venkatagiri Sub-Treasury—G.O., dated 21st January 1884, No. 299, Revenue Department	120
Total ...	1,860

Allowing for a small reserve to meet unforeseen requirements, the Board think that a provision of at least Rs. 42,400 should be retained to meet the cost of temporary establishments. This will leave a saving of Rs. 19,000 as against Rs. 35,000 assumed by Government. The difference, viz., Rs. 16,000, may, however, be met from the following items:—

	RS.
Extra tentage and travelling allowance to officers	7,000
Office rent	2,000
Miscellaneous contingent expenditure other than office contingencies	7,000
Total ...	16,000

3. The reductions to be made under the minor heads of Land-revenue will then stand as follows:—

	RS.
1. Salaries of Assistant Collectors	50,000
2. Do. of Deputy Collectors	20,000
3. Temporary establishments	19,000
4. Extra tentage and travelling allowance of officers	7,000
5. Office rent	2,000
6. Service of revenue processes	50,000
7. Purchase of land at revenue sales and miscellaneous	27,000
Total ...	1,75,000
Settlement ...	25,000
Grand Total ...	2,00,000

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department.

ORDER—dated 14th May 1884, No. 643, Revenue.

Land Revenue, No. 74.

The readjustment of retrenchments proposed by the Board is approved and sanctioned.

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2. It is observed, however, that the provision of Rs. 18,000, insisted upon for Assistant Collectors' establishments (by far the largest item under Temporary Establishment), is based on the assumption that there will be a passed Assistant in every district throughout the year.* This is not probable, and the Board have given no actuals to show that it is.

* *Vide* Clause (*d*), paragraph 17 of Board's Proceedings in G.O., dated 15th November 1883, No. 1410, page 6.

3. The Board's calculation in (*a*), paragraph 1, is not understood. If out of Rs. 2,880 originally provided for surveying waste lands in Kistna, Rs. 2,052 are transferred to the head Permanent Establishment, the resulting saving is Rs. 2,052 itself, and not Rs. 576. This last-mentioned sum is arrived at by the Board by deducting Rs. 2,052 as well as the sum of Rs. 252, retained under the head Temporary Establishment, from the original provision, Rs. 2,880; but the question is as to the retrenchment to be made in the provision for temporary establishments, and so trivial an increment as Rs. 2,052 to the cost of permanent revenue establishment, amounting to about 28 lakhs of rupees, does not require that a margin should be provided under the former head to cover it.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Accountant-General.
,, the Financial Department.

Exd. W. H. French.

80 Copies.

Inw No 1609/86

Govt. of (1884) Madras

REVENUE.

Issued

Recd. Encl.

G.O., 14th May 1884, No. 643.

No 1751/95

MAY.

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre.
Madras 3d June 1884

(By order)
[signature]
1st. Assistant

To
The Dy: Director, Party No III

Retrenchments.

The readjustment of certain — proposed by the Board under the head of Land Revenue Charges for 1884-85, approved.

28TH APRIL 1884, NOS. 562, 562A, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from Brigade-Surgeon G. BIDIE, M.B., C.I.E., Superintendent, Government Central Museum, to the Secretary to Government, Revenue Department, dated Madras, 15th April 1884, No. 378 :—

With reference to the marginally-noted orders of Government, I have the honor to report to the Right Honorable the Governor in Council, that during the past year specimens of the chief indigenous honey-making bees were obtained from the marginally-noted districts and sent to the British Museum, where, through the intervention of Dr. Günther, they were kindly identified by Mr. Kirby. This task was undertaken with the view of facilitating reference to the different species; as hitherto some confusion has existed in their popular nomenclature.

G.O., Revenue Department, Nos. 555, 555A, of 27th May 1882.
G.O., Revenue Department, Nos. 1111, 1111A, of 12th October 1882.

Anantapur.	Madura.
Arcot (North).	Malabar.
Canara (South).	Nellore.
Coimbatore.	Salem.
Ganjam.	Tinnevelly.
Godávari.	Trichinopoly.
Kurnool.	Wynaad.

2. Before proceeding further, I beg to place on record my great obligations to the various Revenue officers and members of the Forest Department, who were good enough, on my simple requisition, to forward specimens of bees to the Museum. But for their aid in furnishing these, our knowledge of the number and geographical distribution of species must have still continued limited.

3. Over a hundred collections from different parts of the country were forwarded to the British Museum, and the whole of the specimens examined there have been referred to the following four species and three varieties of *Apis*, viz. :—

Apis indica, *Fabr.*	Apis dorsata, *Fabr.*
Do. floralis, *Fabr.*	Do. do. *var.* testacea, *Smith.*
Do. nigrocincta, *Smith.*	Do. do. *var.* Zonata, *Guer.*
Do. do. *var* (?).	

(1) APIS INDICA (*Fabr.*)—*Distribution.*—This bee is very widely distributed, ranging over the whole of the Presidency from Ganjam in the north to the southern extremity of the peninsula. It is mostly confined to the plains and low hill ranges, but appears also on the upper slopes of the Nílgiris.

Synonyms.—The following are some of its vernacular names *:—

Binchona Mohu Machi.	Pulla Thanateega.
Kolavee Thanee.	Thudve Jain Hoola.
Kombu Thanee.	

Description †. $\frac{6}{10}$ inch long: head and thorax black with greyish pubescence: abdomen glabrous, first two segments, and generally the base of the third, reddish brown.

The *Apis indica* attaches its combs to branches, or establishes itself in hollows of the trunks of trees. The combs are under an inch in thickness, and half a foot or more in width. This bee is said to be on the move in April, and to remain some three or four months afterwards in the same place. The honey is good, and is got by smoking or driving away the bees.

* In every case the vernacular names are given as received from the districts.
† This and succeeding descriptive notes refer solely to the workers.

Apis indica stings when irritated, but the sting does not give much annoyance.

(II) APIS FLORALIS (*Fabr.*)—*Distribution.*—This bee has also a wide geographical range, specimens having been got from the extreme north down to Tinnevelly, and from the east and west coasts. It seems to be chiefly confined to the plains and low rocky hills, but appears in the Wynaad district.

Synonyms.—These are—

Attoopoodookhoo Thanee.
Chitti Thanateega.
Gittoo Thanee.
Junnu or Chinna Ega.
Karra Thanateega.
Kombu Janu Hoolah.
Komma Thaneega.
Kothen Icha.
Kuddy Jain.
Moolam Thanee.
Pulla Thanateega.
Seroo Thanee.
Sippan Thanee.
Thadipathri Thanateega.

Description.—$\frac{6}{16}$ inch long, a slender bee of elegant shape; head and thorax black and pubescent; first two or three segments of abdomen reddish, remaining segments brown and marked with a line of pale pubescence at basal margin of each segment. In its habits and other particulars it appears to resemble *A. indica*; in fact the two species are probably often confounded.

(III) APIS NIGROCINCTA (*Smith.*)—*Distribution.*—This bee has very much the same geographical range as the two preceding species.

Synonyms.—

Banda Thaneega.
Borra.
Chinnapuvvu.
Chitt Thanee.
Karun Thoduvai Thanee.
Musuru Thanateega.
Perinthen Icha.
Ponthu Thanee.
Satopuri Mohu Machi.
Senthoduvai Thanee.
Thola or Putta Thaneega.
Thorra Thanateega.
Thudoobay Janu Nonah.

Description.—$\frac{6 \text{ to } 8}{16}$ inch in length, a more sturdy bee than the two preceding species; a red crescent-shaped mark on the thorax curving backwards from the insertion of the wings, and with a black band in the rear; first segment of abdomen brown or blackish, remaining segments brown with a red or yellowish basal line.

This species deposits its combs in the hollows of trees and clefts of rocks, and the honey, which is of good quality, is got by smoking the bees. It stings when irritated, but the sting does not cause much pain or other annoyance. It does not appear to migrate, but remains in or near the same spot throughout the year.

(IV) APIS NIGROCINCTA (*var?.*)—*Distribution.*—This elegant little insect, known as the "mosquito-bee," is distributed over the whole of the Madras Presidency, and very common. It is confined to the plains and low rocky hills.

Synonyms.—

Cheru Then Icha.
Kanna Golla Ega.
Karnagutty Thanateega.
Kossuvan Thanee.
Kosu Thanee.
Mujante.
Musuru Thanateega.
Naser Thanee.
Nikiti Mohu Machi.

Description.—$\frac{3}{16}$ inch in length, and with abdominal segments paler than in the ordinary *A. nigrocincta*. In my opinion it differs sufficiently from the latter to be regarded as a distinct species. It builds its nest in crevices of rocks, hollows of trees and ruined buildings, and generally continues season after season to lodge in the same place, if not disturbed. The quantity of honey in a nest is small and not of very good quality.

(V) APIS DORSATA (*Fabr.*)—*Distribution.*—This bee is also widely distributed, but not so common as *A. indica*, being chiefly found amongst low hills and in forests.

[A friend assures me that a colony of large bees took up its abode some few years ago in the *porte-cochère* of the Royal Hotel, Madras. One day a coachman struck the

nest with his whip, when the bees attacked him and his horse in the most furious manner. The results were that both man and horse died from the stings. This must have been *A. dorsata* or some variety of it.]

Synonyms.—

Hedge Janu Hoolah.	Parun Thanee.
Konda Thaneega.	Perya.
Malan Thanee.	Perya Thanee.
Malanthen Icha.	

Description.—$1\frac{2}{16}$ inch long. Head black, pubescent; fore and centre parts of thorax black, the rest dull greyish orange, pubescent; first three segments of abdomen brick-red, the others gradually shading off into brown.

This bee invariably lodges on the branches of trees and in clefts of rocks, and has favorite haunts so that although the honey be taken year after year, a swarm always occupies the old locality. "So much is this the case, that the jungle-men in their rules among themselves lay claim to certain trees, or certain rocks." The comb of this bee is of a large size, often several feet in length, and over an inch in thickness. The honey is collected in different months in different parts of the country, but mostly in the hot season.

It is the best of all Indian honeys, but can only be collected by jungle tribes accustomed to the work, owing to the inaccessible nature of its haunts, its ferocity, and the dangerous nature of its sting. At the periods when the combs are full of honey or young bees it gets very irritable, and will assail men and animals on the slightest provocation. Cattle, horses and even men have fallen victims to its attacks, and ten to twenty stings are dangerous to human life. In collecting the honey from cliffs the men either let themselves down at night by a line of long bamboos tied together, or by rattan ladders. In some districts smoke is used while the combs are being secured to keep away the bees, in others the men seem to disregard the bees, and apparently do not get stung to any extent.

(VI) APIS DORSATA *var.* TESTACEA (*Smith.*)—*Distribution.*—Specimens of this variety were got from Madura, South Canara, Anantapur and Kurnool. It is probably widely distributed, although not recognised as distinct from the ordinary large rock bee by natives, as the difference between the two is not very marked.

Synonyms.—

Pedda Ega.	Poola Thanateega.
Peroon Thanee.	

Description.—$1\frac{2}{16}$ inch; anterior segments of abdomen of a more decided brick color, and posterior ones of a deeper brown than in *A. dorsata.* It is understood that this variety is so far as regards its haunts, habits, irritability, size of comb-honey, &c., identical with the ordinary *A. dorsata.*

(VII) APIS DORSATA *var.* ZONATA (*Guer.*)—*Distribution*—Specimens of this variety were obtained from Ganjam, Nellore, North Arcot and Trichinopoly, and, as was remarked regarding the other variety, it is probably pretty widely distributed.

Synonyms.—

Bagho.	Pedda pera Ega.
Para Thaneega.	Varaithenca Thanee.

Description.—$1\frac{4}{16}$ inch and therefore rather longer than the other varieties of the species; anterior two segments of abdomen light brick-red, others with a dark ring on each. Is believed to resemble the other varieties of *A. dorsata* as regards its haunts and other characteristics.

4. *General remarks on Distribution, &c., of South Indian Bees.*—In Dutt's Sanscrit Materia Medica it is stated that four kinds of honey are used in Indian medicine, viz., (1) *Makshika* or honey of the common bee Madhu-makshika; (2) *Brahmara* or honey gathered by a large black bee, brhamara, (3) *Kshaudra* or honey collected by a tawny bee, kshudra; (4) *Pauttika* or honey collected by a small black bee like a gnat, called puttika. Buchanan, in his Mysore, speaks of four species observed by him in the north-east parts of the Rajah's territory, viz:—

(1.) *Hegenu* a large bee, that builds in rocks, from which most of the honey is got and which stings furiously.

(2.) *Cadi* or *Chitti Jainu* which builds around the branch of a tree. Is said to sting (?)

(3.) *Tuduvay* builds deep in crevices of rocks or in hollow trees, rarely stings; a large bee.

(4.) *Togriga* is a very small bee that seldom stings and takes up its abode in white ants' nests.

No. 1 of the above is some variety of *A. dorsata*. No. 2 is doubtless *A. indica*. No. 3 is probably *A. nigrocincta* and No. 4 is the small "Mosquito-bee." Buchanan also speaks of four species found in the Coimbatore district, viz., *Malan ten, Todugy ten, Coshu ten, Cambu ten.*

These may be identified as *Apis dorsata, A. nigrocincta, A. nigrocincta* (var?) and *A. indica*, respectively. The large bee *A. dorsata* and the common *A. indica* seem to be the chief honey-making species which live on the higher hills, such as the Nílgiris. The other species are, so far as known, confined to the plains and low hills. The number of the nests and also the strength of the colonies of bees depend largely on the existence of certain flowers which they like. Thus Mr. Morgan remarks that "whenever any species of Strobilanthes flowers colonies of bees migrate from all parts of the country to feast on the honey." Mr. S. Carroll of South Canara alludes to the same fact and also mentions the popular belief, that the Strobilanthes only flowers once in 10 years, and that bees' nests are most plentiful in the years in which the favorite flowers abound. Some of the species, such as the large bee *A. dorsata*, and its varieties also *A. nigrocincta* and the minute "*Mosquito-bee*," frequent the same localities year after year, but the others are migratory the site of the nest being selected apparently with a view to secure safety from foes, and so as to be within convenient distance of flowers. In countries in which bees are domesticated, the hives are moved from place to place so as to supply them with fresh pasture. This was done in ancient Greece and the Roman territories, and the practice is still carried on in Egypt, Italy, France, Scotland, &c.

5. *Enemies of Bees.*—In this country the chief enemies of bees are the Bee-eater, *Merops viridis*; wood-peckers; shrikes and other birds; rats; lizards; ants and wasps.

6. *Effects of flowers on the quality of the honey.*—Bees collect honey indiscriminately from flowers, but the quality of the sweet varies very much according to the source from which it is drawn. Thus honey gathered from *Strobilanthes* and *Mesua-ferrea* is said to be specially good and well flavored, and it is believed that jungle-honey generally partakes of the flavor of the flowers from which it is obtained. It is also a well-established fact, that honey gathered from poisonous plants is deleterious. Some years ago I published an account of a case, in which honey from Coorg produced considerable gastric irritation and a fleeting skin eruption. This was believed to be due to the bees having collected the honey from *Lobelia excelsa*. Honey got from the flower of the prickly-pear is said to be hot. The classical story of Xenophon may also be referred to, regarding the effects of honey on the army of Ten Thousand near Trebisond. Some who partook of it were affected like persons inebriated, while several became furious and were seemingly in the agonies of death.

7. *Folk-lore, &c.*—Pliny says that bees afford presages both of private and public interest, clustering, as they do, like a bunch of grapes, upon houses or temples: presages in fact, that are often accounted for by great events. In some parts of Great Britain at the present day, if a swarm of bees takes up its abode in the hollow of a tree near a house or in any part of a building, the circumstance is regarded as a good omen. In South India on the contrary the arrival of a swarm of bees is regarded as a sign of bad luck, and an indication that some of the inmates of a house are to die or go away. There can be no doubt that domesticated bees get accustomed to persons and animals who frequent the neighbourhood of their hives, and are less prone to attack them than strangers. It is also a well-established fact that the sting of Eastern bees is much more venomous than that of bees of temperate climates. Numerous stories are told of the stinging power of bees having been turned to practical account. Thus a German

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mob threatened to pillage the house of the minister of Elende in Thuringia. He besought them to desist, but, as they would not be persuaded, he ordered his servants to fetch his bee-hives and throw them into the crowd. The effect was magical, as every one took to flight to escape stinging. It is also said that when a small privateer with hives on board was attacked by a Turkish galley, the men of the privateer took to the rigging and hurled the hives down on the Turks. The latter, astonished at this mode of warfare and unable to defend themselves, escaped as fast as they could.

8. I have to request the favor of a copy of the Proceedings of Government on the subject being sent to each district specified in paragraph 1, and that a few copies may also be sent to the Forest Department.

ORDER—dated 28th April 1884, No. 562, Revenue.

Miscellaneous.

The acknowledgments of Government are due to Dr. Bidie for his interesting report, which will be communicated, through the Board of Revenue, to the Conservators of Forests and to all Collectors and to the Director of Agriculture, who will furnish copy to Mr. Morris.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Superintendent, Government Central Museum.

No. 562A.

Copy to the Government of India, Department of Revenue and Agriculture.

(Signed) H. E. STOKES,
Secretary to Government.

Exd. W. H. French.

ies.

Dn No. 1403/84

Gobt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 28th April 1884, Nos. 562, 562A.

APRIL.

Honey-making Bees.

Thanking Dr. Bidie for his report on the — of this Presidency and communicating it to certain authorities.

No. 1341

Communicated to the officers in charge of Settl. Parties, Agricultural Reporter, Inspector of Cattle Diseases — Messrs. Morris & Nicholson and Dr. Shortt

(By order)

[illegible]

1st Assistant

Deptt. of Reve: Settl. & Agriculture

Madras 2nd June 1884

To

The Dy. Director of Reve: Settl. Party No. III

[illegible]

10.6.94 CLX
R. No. 56
FINAL ISSUE.
161

PRODUCTIVE PUBLIC WORKS, IRRIGATION AND NAVIGATION.

MADRAS PRESIDENCY.

PUBLIC WORKS DEPARTMENT.

IMPERIAL BUDGET ESTIMATE

OF

PRODUCTIVE PUBLIC WORKS, IRRIGATION AND NAVIGATION,

IN THE

MADRAS PRESIDENCY,

FOR THE YEAR

1884-85.

29th April 1884.

(Signed) J. O. HASTED, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

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GOVERNMENT OF MADRAS.

BUDGET ESTIMATE OF THE IMPERIAL REVENUE FROM IRRIGATION WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR FROM THE 1ST APRIL 1884 TO 31ST MARCH 1885.

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Realisations, 1882-83.
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
G. REVENUE FROM PRODUCTIVE PUBLIC WORKS. —REVENUE ACCOUNT.				
XXVII. IRRIGATION AND NAVIGATION—DIRECT RECEIPTS.				
Imperial.				
Godávari Delta System	79,000	82,500	91,050	76,747
Kistna Delta System	50,200	49,800	36,580	49,727
Pennér Anicut System	200	260	400	157
Cauvery Delta System	8,000	8,000	9,100	8,393
Srívaikuntham Anicut System	2,000	2,000	1,100	1,854
Kurnool-Cuddapah Canal	10,000	5,000	5,000	76,023
Total ...	1,49,400	1,47,560	1,43,230	2,12,901

REVENUE.

IRRIGATION.
PRODUCTIVE PUBLIC WORKS.

MADRAS PRESIDENCY.

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GOVERNMENT OF MADRAS.

BUDGET ESTIMATE OF THE PORTION OF LAND REVENUE DUE TO IRRIGATION UNDER PRODUCTIVE PUBLIC WORKS.

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Realisations, 1882-83.
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
G. REVENUE FROM PRODUCTIVE PUBLIC WORKS.—REVENUE ACCOUNT.				
XXVIII. PORTION OF LAND REVENUE DUE TO IRRIGATION.				
Imperial.				
Godávari Delta—				
Irrigation Revenue	16,20,000	16,20,000	17,22,000	15,56,401
Deduct Revenue due to old Irrigation	1,30,000	1,30,000	1,30,000	1,25,184
Revenue due to the System	14,90,000	14,90,000	15,92,000	14,31,217
Share of enhanced Land Revenue	1,50,000	1,50,000	1,60,000	1,51,165
Total ...	16,40,000	16,40,000	17,52,000	15,82,382
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	1,18,080	1,18,080	1,26,144	1,13,931
Net Revenue ...	15,21,920	15,21,920	16,25,856	14,68,451
Kistna Delta System—				
Irrigation Revenue	9,00,000	9,00,000	9,75,000	8,29,896
Deduct Revenue due to old Irrigation	76,000	76,000	76,000	75,102
Revenue due to the System	8,24,000	8,24,000	8,99,000	7,54,794
Share of enhanced Land Revenue	1,30,000	1,30,000	1,30,000	1,26,247
Total ...	9,54,000	9,54,000	10,29,000	8,81,041
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	68,688	68,688	74,088	63,435
Net Revenue ...	8,85,312	8,85,312	9,54,912	8,17,606
Pennér Anicut—				
Irrigation Revenue	2,30,000	2,30,000	2,30,000	2,34,957
Deduct Revenue due to old Irrigation	1,20,000	1,20,000	1,13,000	1,20,350
Revenue due to the System	1,10,000	1,10,000	1,17,000	1,14,607
Share of enhanced Land Revenue	15,000	15,000	15,500	15,210
Total ...	1,25,000	1,25,000	1,32,500	1,29,817
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	9,000	9,000	9,540	9,347
Net Revenue ...	1,16,000	1,16,000	1,22,960	1,20,470
Cauvery Delta—				
Irrigation Revenue	29,00,00[illegible]	29,00,000	31,08,000	29,04,846
Deduct Revenue due to old Irrigation	23,40,9[illegible]	23,40,000	23,25,000	23,43,214
Revenue due to the System	5,60,0[illegible]	5,60,000	7,83,000	5,61,632
Share of enhanced Land Revenue	1,36,00[illegible]	1,36,000	1,36,000	1,36,508
Total ...	6,96,00[illegible]	6,96,000	9,19,000	6,98,140
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	50,112	50,112	66,168	50,266
Net Revenue ...	6,45,[illegible]8	6,45,888	8,52,832	6,47,874

GOVERNMENT OF MADRAS.

BUDGET ESTIMATE OF THE PORTION OF LAND REVENUE DUE TO IRRIGATION [illegible] PRODUCTIVE PUBLIC WORKS—*continued.*

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Realisations, 1882-83.
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
G. REVENUE FROM PRODUCTIVE PUBLIC WORKS —REVENUE ACCOUNT—continued.				
XXVIII. PORTION OF LAND REVENUE DUE TO IRRIGATION—continued.				
Imperial—continued.				
Srivaikuntham Anicut—				
Irrigation Revenue	1,70,000	1,70,000	1,70,000	1,71,74[illegible]
Deduct Revenue due to old Irrigation	78,000	78,000	97,500	77,64[illegible]
Revenue due to the System	92,000	92,000	72,500	94,09[illegible]
Share of enhanced Land Revenue	2,000	2,000	2,000	2,24[illegible]
Total ...	94,000	94,000	74,500	96,347
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	6,768	6,768	5,364	6,93[illegible]
Net Revenue ...	87,232	87,232	69,136	89,41[illegible]
Kurnool-Cuddapah Canal—				
Irrigation Revenue	70,000	57,000	85,000	...
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	5,040	4,104	6,120	...
Net Revenue ...	64,960	52,896	78,880	...
Total—				
Irrigation Revenue	58,90,000	58,77,000	62,90,000	56,97,84[illegible]
Deduct Revenue due to old Irrigation	27,44,000	27,44,000	27,41,500	27,41,49[illegible]
Revenue due to the System	31,46,000	31,33,000	35,48,500	29,56,349
Share of enhanced Land Revenue	4,33,000	4,33,000	4,43,500	4,31,378
Total ...	35,79,000	35,66,000	39,92,000	33,87,727
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	2,57,688	2,56,752	2,87,424	2,43,916
Net Revenue ...	33,21,312	33,09,248	37,04,576	31,43,811

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GOVERNMENT OF MADRAS.

ABSTRACT BUDGET ESTIMATE OF THE CHARGES FOR IRRIGATION WORKS IN THE MADRAS PRESIDENCY FROM 1ST APRIL 1884 TO 31ST MARCH 1885.

——	Reference to detailed Estimates.	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Outlay, 1882-83.
1	2	3	4	5	6
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.	Page.	Rs.	Rs.	Rs.	Rs.
51. IRRIGATION AND NAVIGATION.					
Imperial.					
I.—Works	8 to 12	16,06,162	12,12,226	11,81,693	7,49,287
II.—Establishment	22	3,34,718	2,60,383	2,50,621	1,64,510
III.—Tools and Plant	23	43,120	1,54,744	67,686	78,237
Less Receipts on Capital Account		...	...	...	— 1,088
Total ...		19 84,000	16,27,353	15,00,000	9,90,946
Kurnool Canal (purchase money)		...	1,28,000	1,60,000	1,76,25,819
Total ...		1[illegible]84,000	17,55,353	16,60,000	1,86,16,765
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.					
38. IRRIGATION AND NAVIGATION (WORKING EXPENSES).					
Imperial.					
I-A.—Extensions and Improvements	13 & 14	16,564	1,07,734	1,08,620	65,465
I-B.—Maintenance and Repairs	15 to 20	4,17,298	4,12,881	5,22,000	3,44,604
II.—Establishment	22	3,26,483	3,22,478	2,68,674	3,08,442
III.—Tools and Plant	24	...	59,316	47,145	58,086
Additional Allotment provisionally allowed to stand pending further consideration		...	...	2,63,161	...
Refunds of Revenue		...	...	...	7,513
Total ...		9,20,590	9,02,409	12,09,600	7,84,110
Totals.					
I.—Works including Extensions and Improvements.	8 to 14	[illegible]22,726	13,19,960	12,90,313	8,14,752
I-B.—Maintenance and Repairs	15 to 20	[illegible]17,298	4,12,881	5,22,000	3,44,604
II.—Establishment	22	[illegible]61,206	5,82,861	5,19,295	4,72,952
III.—Tools and Plant	23 & 24	[illegible]03,360	1,99,060	1,14,831	1,36,323
Additional Allotment provisionally allowed to stand pending further consideration			...	2,63,161	...
Less Receipts on Capital Account		...	...	...	— 1,088
Refunds of Revenue		...	...	...	7,513
Kurnool Canal (purchase money)		...	1,28,000	1,60,000	1,76,25,050
Total ...		[illegible]04,590	26,42,762	28,69,600	1,94,00,106

GOVERNMENT OF MADRAS.

PART I.

[B]UDGET ESTIMATE OF EXPENDITURE ON IRRIGATION WORKS IN THE MADRAS PRESIDENC[Y] FOR THE YEAR 1884-85, ARRANGED BY SYSTEMS.

—	Amount of Estimate.	Amount of Actual Outlay to end of 1882-83.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Budget Estimate, 1884-85.	Remarks and References.
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.						
51. IRRIGATION AND NAVIGATION.						
Imperial.						
Works in Progress.						
Godávari Delta System ...	1,10,88,695	92,39,974	3,91,951	3,50,000	4,58,000	Government of India Register No. 3 I. of 1882-83.—Proceedings of Madras Government, No. 514 I., of 4th July 1882, and No. 854 I., of 23rd October 1882.
Kistna Delta System ...	1,38,99,784	58,74,768	4,43,131	4,50,000	5,25,000	Government of India Register No. 14 I. of 1881-82.—Proceedings of Madras Government, No. 291 I., of 28th March 1882.
Sangam Anicut System ...	28,96,437	7,57,154	5,93,470	4,64,000	6,08,000	Government of India Register No. 4 I. of 1881-82.—Proceedings of Madras Government, No. 352 I., of 2nd June 1881.
Cauvery Delta System ...	16,80,217	10,47,663	1,33,558	2,00,000	2,66,000	Government of India Register No. 8 I. of 1883-84.—Proceedings of Madras Government, No. 778 I., dated 21st September 1883.
Srívaikuntham Anicut System	13,61,520	12,38,078	54,240	36,000	41,500	Government of India Register No. 10 I. of 1883-84.—Proceedings of Madras Government, No. 863 I., dated 3rd November 1883.
Kurnool-Cuddapah Canal ...	1,77,53,819	1,76,25,819	1,28,000	1,60,000	...	Proceedings of Madras Government, No. 993 I., dated 5th December 1883.
Barur Tank Project	3,20,000	1,00,070	11,003	...	85,500	Government of India Register No. 1 of 1883-84.—Proceedings of Madras Government, No. 714 I., dated 3rd September 1883.
Total ...	4,90,00,472	3,58,83,526	17,55,353	16,60,000	19,84,000	
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.						
38. Irrigation and Navigation.						
(Working Expenses.)						
Imperial.						
Godávari Delta System ...	...	...	3,76,950	2,85,621	3,64,937	
Kistna do. do. ...	...	...	2,81,482	2,38,220	2,91,160	
Pennér Anicut do. ...	...	...	15,930	31,140	14,275	
Cauvery Delta do. ...	...	...	37,630	1,28,034	9,919	
Srívaikuntham Anicut System	...	...	8,681	22,798	19,997	
Kurnool-Cuddapah Canal ...	...	...	1,81,736	2,40,626	2,20,302	
Additional allotment provisionally allowed to stand pending further consideration.	...	...	...	2,63,161	...	
Total ...	...	...	9,02,409	12,09,600	9,20,590	
Grand Total ...	...	...	26,57,762	28,69,600	29,04,590	

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GOVERNMENT OF MADRAS.

PART I—continued.

BUDGET ESTIMATE OF EXPENDITURE IN ENGLAND ON IRRIGATION WORKS IN THE MADRAS PRESIDENCY, FOR THE YEAR 1884-85, ARRANGED BY PROJECTS AND OBJECTS OF WORKS.

——	Budget Estimate, 1884-85.				Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Outlay, 1882-83.
	Works.	Tools and Plant.	Suspense Account.	Total.			
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.							
51. Irrigation and Navigation.							
Imperial.							
Godávari Delta System	...	...	...	...	5,000	...	...
Kistna Delta System	...	...	...	...	20,270	...	...
Cauvery do.	...	4,000	...	4,000	4,730	...	...
Kurnool-Cuddapah Canal	...	...	...	...	1,28,000	1,60,000	1,76,25,819
Total ...	...	4,000	...	4,000	1,58,000	1,60,000	1,76,25,819
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.							
38. Irrigation and Navigation.							
Imperial.							
Nil.							

GOVERNMENT

PART

DETAIL OF BUDGET ESTIMATE FOR

Division.	Item No.	Details.	Amount of Estimate.	A, B, or C Class.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.	Rs.	
		51. Irrigation and Navigation.		
		Imperial.		
		Godavari Delta System.		
		Eastern Section.		
Godávari Eastern Division.	1	Cocanada Canal	2,19,481	A.
	2	Sámalkót do.	1,57,393	A.
	3	Bank do.	3,08,511	A.
	4	Mundapetta do.	58,852	A.
	5	Coringa do.	77,917	A.
	6	Injeram do.	42,378	A.
	7	Tooliabhaga Drain	1,47,988	A.
	8	Biccavole do.	72,307	A.
	9	Taki do.	2,44,875	A.
		Total, Eastern Section ...	...	
		Central Section.		
Godávari Central Division.	10	Head Works	16,300	A.
	11	Main Canal	40,870	A.
	12	Gunnaram Canal	3,11,440	A.
	13	Bank do.	1,69,970	A.
	14	Amalápuram do.	1,63,480	A.
	15	Bendamurlunka Canal	66,070	A.
	16	Drainages	1,03,733	A.
		Total, Central Section ...	...	
		Western Section.		
Godávari Western Division.	17	Main Canal	54,590	A.
	18	Kakaraparru Canal	59,112	A.
	19	Gostanadi and Velpur Canal	2,18,860	A.
	20	Bank Canal	1,50,074	A.
	21	Narsápur do.	2,18,224	A.
	22	Ellore do.	2,80,096	A.
	23	Attili do.	81,891	A.
	24	Junction do.	75,428	A.
	25	Venkiah and Weyeru Canal	29,439	A.
	26	Undi Canal	1,44,230	A.
	27	Nakkala Drain	22,700	A.
	28	Yenamaduru do.	27,725	A.
	29	Gontair do.	24,500	A.
	30	Buggeswaram do.	16,300	A.
	31	Caza do.	10,886	A.
	32	Rudrayakodu do.	3,500	A.
	33	Minor drains	11,613	
		Total, Western Section ...	...	
		Total, Godávari Delta System ...	...	
		Kistna Delta System.		
		Eastern Section.		
Kistna Eastern Division.	34	Ryves' Canal	5,76,951	A.
	35	Head Works	1,31,685	A.
	36	Masulipatam Canal	2,43,520	A.
	37	Ellore do.	2,46,930	A.
	38	Bank Canal and its drainages	10,71,836	A.

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OF MADRAS.

II.

WORKS FOR THE YEAR 1884-85.

Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item No.	Remarks and References.
Rs.	Rs.	Rs.		
2,05,658	5,680	1,712	1	Government of India Register No. 3 I. of 1882-83. G.O., No. 854 I., of 23rd October 1882.
1,40,758	6,277	4,218	2	
2,32,342	43,620	14,163	3	
48,776	3,470	6,600	4	
62,235	2,863	8,626	5	
28,130	840	5,740	6	
1,19,790	4,090	16,500	7	
55,544	1,000	6,900	8	
1,89,231	1,886	20,541	9	
...	...	85,000		
...	8,180	5,500	10	Government of India Register No. 3 I. of 1882-83. G.O., No. 854 I., of 23rd October 1882.
263	3,220	5,000	11	
37,031	53,780	68,000	12	
4,816	15,310	12,140	13	
...	15,000	42,500	14	
...	...	14,260	15	
3,968	32,250	32,600	16	
...	...	1,80,000		
52,989	5,050	100	17	Government of India Register No. 3 I. of 1882-83. G.O., No. 854 I., of 23rd October 1882.
52,884	4,000	100	18	
1,27,653	30,750	32,342	19	
1,31,636	5,200	9,750	20	
2,11,442	3,500	2,350	21	
2,65,912	3,700	5,562	22	
78,890	500	1[illegible],650	23	
73,825	700	800	24	
8,531	3,500	7,410	25	
95,590	5,000	16,950	26	
...	9,200	12,800	27	
24,053	500	3,140	28	
18,218	400	4,700	29	
6,491	9,040	650	30	
10,686	30	50	31	
...	300	2,700	32	
2,413	530	3,946	33	
...	...	1,05,000		
...	...	3,70,000		
3,88,589	35,910	12,000	34	G.O., No. 799 I. of 9th October 1882. G.O., No. 181 I., dated 28th February 1882.
...	2,435	9,000	35	
...	2,068	20,000	36	
11,347	30,515	36,000	37	
4,837	2,000	7,000	38	

GOVERNMENT

PART

DETAIL OF BUDGET ESTIMATE FOR

Division.	Item No.	Details.	Amount of Estimate.	A, B, or C Class.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.	Rs.	
		51. Irrigation and Navigation—continued.		
		IMPERIAL—*continued.*		
		Kistna Delta System—continued.		
		Eastern Section—cont.		
Kistna Eastern Division—*cont.*	39	Uppulluru Drain	28,725	A.
	40	Lazzabanda drain and its affluents	2,19,034	A.
		Total, Eastern Division ...	...	
Gudiváda Division ...	41	Pulleru Canal	3,14,050	A.
	42	Polraz do.	2,98,504	A.
	43	Ryves' do.	*	A.
	44	Bantumilli Canal	1,49,062	A.
	45	Polraz Drain	1,87,130	A.
	46	Chendrayacodu Drain	1,43,402	A.
	47	Pullava Main Drain and its affluents	21,345	A.
	48	Dammidi Drain	8,206	A.
	49	Peddacommeleru Drain and its affluents	41,441	A.
	50	Peddalunka Drain and its affluents	89,223	A.
		Total, Gudiváda Division ...	...	
		Western Section.		
Kistna Western Division.	51	Main Canal	5,38,020	A.
	52	Commamur Canal	10,11,717	A.
	53	Bank Canal	4,10,362	A.
	54	Repalle Drain	2,43,792	A.
	55	Tungabhadra Drain	6,15,191	A.
	56	Romperu Drain	1,84,[illegible]	A.
		Total, Western Division ...	...	
		Total, Kistna Delta System ...	...	
		Sangam Anicut Project.		
Sangam Division ...	57	Head Works	4,55,518	A.
	58	Kanigiri Canal	8,18,944	A.
	59	Duvur do.	11,005	A.
	60	Eastern Channel	3,14,070	A.
	61	Yellayapallem Branch Channel	15,400	A.
	62	Allur Channel	26,510	A.
	63	Allur Branch Channel	30,000	A.
	64	Southern Channel	2,83,690	A.
	65	Central do.	52,700	A.
		Total, Sangam Anicut System ...	...	
		Barur Tank Project.		
Salem	66	Nedungal Anicut	18,035	A.
	67	Agaram Channel	10,655	A.
	68	Barur Tank and supply channel	2,08,178	A.
		Total, Barur Tank Project ...	...	
		Cauvery Delta System.		
Cauvery and Vennár Regulators Division.	69	Head Works	78,585	A.
	70	Cauvery Improvements	1,59,640	A.
	71	Vennár do.	2,28,325	A.
		Total, Cauvery Delta System ...	...	

OF MADRAS.

II—continued.

WORKS for the YEAR 1884-85—*continued.*

Outlay. To end of 1882-83.	Outlay. Probable during 1883-84.	Grant, 1884-85.	Item No.	Remarks and References.
Rs.	Rs.	Rs.		
...	510	6,950	39	G.O., No. 272 I., of 29th March 1883.
...	3,500	18,050	40	G.O., No. 179 I., of 26th February 1883.
...	...	1,09,000		
...	10,492	35,460	41	
7,719	56,472	29,780	42	
*	656	8,400	43	* *Vide* Budget Item No. 34.
50	5,149	11,800	44	
...	13,518	14,500	45	
163	12,192	11,770	46	Government of India Register No. 14 I. of 1881-82. P.M.G., No. 291 I., of 28th March 1882.
...	2,100	3,200	47	
...	...	1,000	48	
...	...	6,000	49	
...	120	4,090	50	
...	...	1,26,000		
92,419	39,200	44,000	51	
3,77,280	43,937	45,500	52	
2,505	23,210	33,000	53	Government of India Register No. 14 I. of 1881-82. P.M.G., No. 291 I., of 28th March 1882.
9,992	28,525	40,000	54	
...	80	12,000	55	
...	...	10,000	56	
...	...	1,84,500		
...	...	4,19,500		
2,77,457	1,35,200	1,06,940	57	
2,78,828	2,11,346	1,85,100	58	
1,445	2,900	5,930	59	
10,743	65,000	42,000	60	
...	1,000	9,250	61	Government of India Register No. 4 I. of 1881-82. P.M.G., No. 352 I., of 2nd June 1881.
...	...	15,540	62	
...	1,500	17,950	63	
5,062	9,500	81,800	64	
62	7,500	35,490	65	
...	...	5,00,000		
...	...	18,000	66	
...	...	5,000	67	Government of India Register No. I. of 1883-84. P.M.G., No. 714 I., dated 3rd September 1883.
80,357	8,000	46,000	68	
...	...	69,000		
10	7,700	43,300	69	
14,484	52,018	60,000	70	Government of India Register No. 8 I. of 1883-84. P.M.G., No. 778, of 21st September 1883.
...	25,500	1,08,700	71	
...	...	2,12,000		

GOVERNMENT

PART

DETAIL OF BUDGET ESTIMATE FOR

Division.	Item No.	Details.	Amount of Estimate.	A, B, or C Class.
		N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT—continued.	Rs.	
		51. Irrigation and Navigation—continued.		
		IMPERIAL—*continued.*		
		Srivaikuntham Anicut System.		
Tinnevelly Division.	72	North Main Channel	5,15,939	
	73	South do.	3,02,962	
		Total, Srívaikuntham Anicut System ...	...	
		Total ...	...	
		G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.		
		38. Irrigation and Navigation (Working Expenses).		
		IMPERIAL.		
		Extensions and Improvements.		
Godávari Eastern Delta.	74	Godávari Delta System, Minor Extensions and Improvements.	...	
Do. Central do.	75	Do. do. do. ...	...	
Do. Western do.	76	Do. do. do. ...	...	
Kistna Eastern do.	77	Kistna Delta System do. do. ...	...	
Gudiváda Division ...	78	Do. do. do. do. ...	...	
Kistna Western Delta.	79	Do do. do. do. ...	...	
Nellore	80	Pennér Anicut System	...	
		Deduct old maintenance charges ...	...	
		Net grant ...	...	
Kurnool Division ...	81	Kurnool-Cuddapah Canal	...	
Negapatam Division ...	82	Cauvery Delta System, Pandavyar Yadiar Dam and Yariangudi Channel, Head-sluice Improvements.	6,830	
Do. ...	83	Do. Pamanyaur—Sharangolam Dam screw shutters to the	6,650	
Do. ...	84	Cauvery Delta System, Minor Extensions and Improvements.	...	
Tanjore Division ...	85	Do. do. do. ...	...	
Tinnevelly do. ...	86	Srívaikuntham Anicut System do. ...	...	
		Deduct old maintenance charges ...	...	
		Net grant ...	...	
		Total ...	...	

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OF MADRAS.

II—*continued.*

WORKS FOR THE YEAR 1884-85—*continued.*

Outlay.		Grant, 1884-85.	Item No.	Remarks and References.
To end of 1882-83.	Probable during 1883-84.			
Rs.	Rs.	Rs.		
4,44,465	30,023	28,545	72	Government of India Register No. 10 I. of 1883-84. P. M. G., No. 863 I., of 3rd November 1883.
2,77,012	17,533	7,117	73	
...	...	35,662		
...	...	16,06,162		
...	8,000	8,000	74	
...	4,000	5,000	75	
...	6,000	7,000	76	
...	5,100	4,500	77	
...	1,400	2,500	78	
...	3,850	4,000	79	
...	5,500	7,000	80	
	3,564	3,564		
	1,936	3,436		
...	34,119	55,000	81	
...	4,000	2,830	82	P. M. G., No. 910 I., of 9th November 1882.
...	3,000	3,650	83	P. M. G., No. 441 I., of 4th June 1883.
...	17,000	15,000	84	
...	2,500	4,000	85	
...	1,760	2,000	86	
...	352	352		
...	1,408	1,648		
...	...	1,16,564		

GOVERNMENT OF MADRAS.

PART II—continued.

GENERAL ABSTRACT OF THE GRANT PROVIDED IN THE PRECEDING ESTIMATE.

—	Imperial Funds.			Contributions.	Local Funds.	Total.
	In India.	In England.	Total.			
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
51. Irrigation and Navigation.						
Godávari Delta System	3,70,000	...	3,70,000	...	...	3,70,000
Kistna Delta System	4,19,500	...	4,19,500	...	...	4,19,500
Sangam Anicut System	5,00,000	...	5,00,000	...	...	5,00,000
Cauvery Delta System	2,12,000	...	2,12,000	...	...	2,12,000
Srívaikuntham Anicut System	35,662	...	35,662	...	...	35,662
Barur Tank Project	69,000	...	69,000	...	...	69,000
Total ...	16,06,162	...	16,06,162	...	...	16,06,162
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.						
38. Irrigation and Navigation (Working Expenses).						
Imperial.						
Extensions and Improvements.						
Godávari Delta System	20,000	...	20,000	...	...	20,000
Kistna Delta System	11,000	...	11,000	...	...	11,000
Pennér Anicut System	3,436	...	3,436	...	...	3,436
Kurnool Canal	55,000	...	55,000	...	...	55,000
Cauvery Delta System	25,480	...	25,480	...	...	25,480
Srívaikuntham Anicut System	1,648	...	1,648	...	...	1,648
Total ...	1,16,564	...	1,16,564	...	...	1,16,564

GOVERNMENT OF MADRAS.

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PART III.

DETAIL OF THE BUDGET ESTIMATE OF MAINTENANCE AND REPAIRS OF IRRIGATION WORKS, FOR THE YEAR 1884-85.

—	Estimate, 1884-85. Amount.	Estimate, 1884-85. Total.	Estimate, 1883-84. Amount.	Estimate, 1883-84. Total.
	Rs.	Rs.	Rs.	Rs.
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS —REVENUE ACCOUNT.				
38.—IRRIGATION AND NAVIGATION.				
(Working Expenses.)				
Imperial.				
Godávari Delta System—				
Eastern Section—				
Head Works	27,000		21,000	
Main Canal	5,000		1,000	
Bank do.	6,000		3,000	
Cocanada do.	8,000		5,500	
Sámalkót do.	6,000		3,500	
Mundapetta do.	5,000		2,750	
Coringa do.	5,000		2,500	
Injeram do.	2,000		1,250	
Tooliabhaga Drain, 31 miles	2,000		1,300	
Takee Drain, 27 „	2,000		1,200	
Biccavole Drain, 17 „	2,000		...	
		70,000		43,000
Central Section—				
Main Canal	2,000		2,000	
Gunnaram do.	8,000		8,000	
Bank do.	5,000		5,000	
Amalápuram do.	6,000		6,000	
Bendamurlanka do.	3,000		3,000	
Kunavaram Drain	1,000		1,000	
Rangarazu Kodu affluent, 7 miles	1,500		1,500	
Inapuram affluent, 8 „	1,000		1,000	
Upper Kowsika drain, 17 miles	1,000		1,000	
Lower do. 22 „	1,500	30,000	1,500	30,000
Western Section—	1,000		400	
Head Works	4,000		2,500	
Main Canal	1,000		2,500	
Kakaraparu Canal	5,000		4,000	
Gostanadi and Velpur Canal	4,000		4,000	
Bank Canal	8,000		14,000	
Narsápur do.	12,000		20,000	
Ellore do.	5,000		7,000	
Attili do.	500		1,000	
Junction do.	6,000		8,000	
Venkiah and Weyeru Canal	11,000		5,000	
Undi Canal	700		500	
Nakkala Drain, 25 miles	2,000		200	
Kaza do. 16 „	700		1,000	
Mogultur do.	600		500	
Gonter do.	500		...	
Gostanadi do.	5,000		4,400	
Yannamadurru Drain, 32 miles	1,000		...	
Gunupudi Drain	300		...	
Bondapad do.	500		1,000	
Pandicodu do.	1,000		1,000	
Tokalapalli do. 9 miles ... ... }				
Ambarpett do. ... ... }				
Bheemadole do. ... ... }	2,000		2,000	
Gundugole do. ... ... }				
Kovali do. ... ... }				
Dendulur do.				

GOVERNMENT OF MADRAS.

PART III—continued.

DETAIL OF THE BUDGET ESTIMATE OF MAINTENANCE AND REPAIRS OF IRRIGATION WORKS FOR THE YEAR 1884-85—*continued.*

—	Estimate, 1884-85.		Estimate, 1883-84.	
	Amount.	Total.	Amount.	Total.
	Rs.	Rs.	Rs.	Rs.
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT—continued.				
38.—IRRIGATION AND NAVIGATION—continued.				
(Working Expenses)—continued.				
Imperial—cont.				
Godávari Delta System—*cont.*				
Western Section—*cont.*				
Kykaram Drain	...		1,000	
Mondicodu do.	200		...	
Old Dyeru	500		...	
Buvvanapalli Drain	50		...	
China Kaparam do.	100		...	
Bondada do.	2,000		...	
Rudrayakodu do.	200		...	
Mallavakodu	100		...	
Siddlapuram drain	50	75,000	...	80,000
Total, Godávari Delta System ...	...	1,75,000	...	1,53,000
Kistna Delta System—				
Eastern Section—				
Kistna Eastern Division—				
Head Works	15,000		29,000 (Head Works and Main Canal)	
Main Canal	12,800			
Ellore do.	14,000		12,000	
Masulipatam do.	21,000		14,500	
Bank do.	200		...	
Ryves' do.	5,000		5,500	
Pulleru do.	1,000		...	
Sivaganga Drain	1,000	70,000	1,500	62,500
Gudiváda Division—				
Pulleru Canal	8,000		6,000	
Ryves' do.	4,500		2,000	
Ellore do.	1,500		...	
Bantumilli Canal	2,500		4,500	
Polaraz do.	2,000		5,000	
Pamarru Junction Canal	500		500	
Chendrayacodu Drain	500		2,500 (Chendrayacodu Drain and Komaravole)	
Komaravole do.	500	20,000		20,500
Western Section—				
Kistna Western Division—				
Main Canal	25,000		16,000	
Bank do.	10,000		16,000	
Commamur Canal	20,000		18,000	
Nizampatam do.	15,000	70,000	13,000	63,000
Total, Kistna Delta System ...	...	1,60,000	...	1,46,000

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GOVERNMENT OF MADRAS.

PART III—continued.

DETAIL OF THE BUDGET ESTIMATE OF MAINTENANCE AND REPAIRS OF IRRIGATION WORKS FOR THE YEAR 1884-85—*continued.*

—	Estimate, 1884-85.		Estimate, 1883-84.	
	Amount.	Total.	Amount.	Total.
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT—continued.	Rs.	Rs.	Rs.	Rs.
38.—IRRIGATION AND NAVIGATION—continued.				
Working Expenses—continued.				
Imperial—continued.				
Pennér Anicut System—				
Head Works ...	3,000		1,000	
Main Canal ...	100		200	
Jaffer Sahib's Canal ...	3,000		4,000	
Sarvapalle do. ...	3,000		4,800	
Kristnapatam do. ...	2,900		5,000	
Delta Tanks and Reservoirs ...	4,000		...	
Total ...	16,000		15,000	
Deduct old maintenance charges ...	13,860		13,860	
Total, Pennér Anicut System ...	...	2,140	...	1,140
Kurnool Canal—				
Special Repairs—				
Head Works ...	...		11,000	
Distributaries ...	...		6,000	17,000
Ordinary Repairs—				
Head Works ...	7,000		7,000	
First Section ...	9,000		9,000	
Second do. ...	8,000		8,000	
Third do. ...	6,000		6,000	
Fourth do. ...	13,000		13,000	
Fifth do. ...	7,000		7,000	
Sixth do. ...	8,600		8,600	
Seventh do. ...	9,300		9,300	
Eighth do. ...	13,100		13,100	
Ninth do. ...	13,000		13,000	
Tenth do. ...	9,000		9,000	
Telegraph Maintenance ...	1,000		1,000	
Distributaries ...	12,000	1,16,000	12,000	1,16,000
Total, Kurnool Canal ...	...	1,16,000	...	1,33,000
Cauvery Delta System—				
Cauvery and Vennar Regulator Division—				
Grand Anicut ...	...		500	500
Tanjore Division—				
Cauvery ...	4,600		8,185	
Kodumurti and Puthaur ...	2,600		500	
Arasillár ...	1,200		150	
Trimulrajen ...	2,200		384	
Mudicondanar ...	1,200		200	
Nattar ...	2,300		150	
Keerthemanar ...	...		268	
Veerasholen ...	500		780	
Munjalaur ...	1,500		500	
Vellapar ...	500		...	
Mahimalayar ...	...		200	
Vanjeaur ...	300		150	

GOVERNMENT OF MADRAS.

PART III—continued.

DETAIL OF THE BUDGET ESTIMATE OF MAINTENANCE AND REPAIRS OF IRRIGATION WORKS FOR THE YEAR 1884-85—continued.

—	Estimate, 1884-85.		Estimate, 1883-84.	
	Amount.	Total.	Amount.	Total.
	Rs.	Rs.	Rs.	Rs.
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT—continued.				
38.—IRRIGATION AND NAVIGATION—continued.				
Working Expenses—continued.				
Imperial—continued.				
Cauvery Delta System—*continued.*				
Tanjore Division—*continued.*				
Noolaur	200		370	
Vennar	3,800		5,728	
Vettar	1,700		2,720	
Chittar	...		460	
Coleroon	...		750	
Pandanvari	...		290	
Nundalar	500		541	
Thencoraiar	...		400	
Vicramanar	500		200	
Yediar Drainage	100		50	
Konar Voikal	500		...	
Narimaniar	300		...	
Thiruvali Tank	500		...	
Mottiar	...		33	
Petharasanar	...		400	
Pravadianar	...		220	
Pudumaniar	300		3,496	
Narasingamperar	...		200	
Ooppanaur	1,200		...	
Vadakorayar	...		100	
Vadavaur	500		...	
Yerananianaur	...		100	
Puthaur	400		260	
Iyavianar	...		500	
Munneyar	1,000		740	
Parayen Voikal	...		75	
Shollanar	600		400	
Tank supply by Vadavaur	1,000		...	
		30,000		26,500
Negapatam Division—				
Vennar	650		4,481	
Koriaur	950		4,645	
Pamanyaur	610		...	
Oiling screw gearing to the above head works	90		...	
Pandaviaur	650		2,735	
Vellayaur	800		1,013	
Permeniaur	...		2,305	
Panayanaur	...		485	
Nattu Varigal	...		70	
Keelthanggaur	...		380	
Mylleyaur	900		2,560	
Harichandranadi	1,000		1,275	
Chittar	...		300	
Iyanaur	150		110	
Autheveraramanaur	120		110	
Vettar	390		355	
Odumboghiaur	480		2,015	
Vennar Samanthan Cauvery	480		...	
Do. Kondiar	496		...	
Do. Chittar	200		...	
Koriaur Penoocondanaur	100		...	
Do. Palampandiar	100		...	
Do. Pudupandiar	100		...	

GOVERNMENT OF MADRAS.

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PART III—continued.

DETAIL OF THE BUDGET ESTIMATE OF MAINTENANCE AND REPAIRS OF IRRIGATION WORKS FOR THE YEAR 1884-85—*continued.*

—	Estimate, 1884-85.		Estimate, 1883-84.	
	Amount.	Total.	Amount.	Total.
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT—continued.	Rs.	Rs.	Rs.	Rs.
38.—IRRIGATION AND NAVIGATION—continued.				
Working Expenses—continued.				
Imperial—continued.				
Cauvery Delta System—*continued.*				
Negapatam Division—*continued.*				
Koriaur Saloovanaur	100		...	
Do. Keelanthanghyaur	100		...	
Harichandranadi Paloovanaur	400		...	
Do. Nallaur	100		...	
Do. Ambothyar	100		...	
Mullyaur Adappaur	500		...	
Do Marakal Karayaur	200		590	
Pandavyaur Chittar	200		...	
Do. Pitchakalyar	150		...	
Do. Yediar	300		...	
Vellayaur Annamarasanar	495		...	
Ragunatha Cauvery	...		335	
Nattoo Voikal	100		...	
Pullavanaur	300		...	
Seeravattanaur	100		...	
Nattaur	...		380	
Kavery Kondanaur	100		...	
Chundranady	200		...	
Sholavathyar	100		...	
Attuveeramanar Chittar	100		...	
Vettar Odemboghyar Kaduvyar	...		...	
Volavoikal	400		...	
Devanadyar	250		...	
Sukkanar	100		...	
Therkodyar	100		...	
Kuthirysavaganar	100		...	
Mungalamalagianar	100		...	
Pamanyar Agamalanar	250		...	
Do. Thirumanyar	500		...	
Unforeseen Works	4,289		5,856	
Special Repairs—				
Adappaur	2,000		...	
Kaduvyar	2,000		...	
Marakakarayar	3,000		...	
Seeravattanar	1,000		...	
Valavanar	2,000		...	
Yadiar	2,000	30,000	...	30,000
		60,000	...	60,000
Total, Cauvery Delta System ...	...	1,05,634	...	1,05,634
Deduct old maintenance charges ...	...	−45,634	...	−45,634
Net Cauvery Delta System ...	...			
Srívaikuntham Anicut System—				
Head Works	3,320		3,320	
South Main channel	2,000		2,000	
Tanks fed by the above channel	3,400		3,400	
North Main channel	2,000		2,000	
Tanks fed by the above channel	3,027		3,027	
Tuticorin fresh water channel	1,153	15,000	1,153	15,000
Deduct old maintenance charges ...	...	5,208	...	5,208
Net Srívaikuntham Anicut System ...	...	9,792	...	9,792

GOVERNMENT OF MADRAS.

PART III—continued.

GENERAL ABSTRACT OF THE GRANTS PROVIDED FOR IN THE PRECEDING ESTIMATE.

—	Imperial Funds.			Contributions.	Local Funds.	Total.
	In India.	In England.	Total.			
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.						
38.—IRRIGATION AND NAVIGATION.						
Working Expenses.						
Imperial.						
Godávari Delta System	1,75,000	...	1,75,000	...	...	1,75,000
Kistna do. do.	1,60,000	...	1,60,000	...	...	1,60,000
Pennér Anicut do.	2,140	...	2,140	...	...	2,140
Kurnool Canal	1,16,000	...	1,16,000	...	...	1,16,000
Cauvery Delta System	— 45,634	...	— 45,634	...	...	— 45,634
Srívaikuntham Anicut System	9,792	...	9,792	...	...	9,792
Total ...	4,17,298	...	4,17,298	...	...	4,17,298

GOVERNMENT OF MADRAS.

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PART IV.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT OF THE IRRIGATION BRANCH IN THE MADRAS PRESIDENCY FOR THE YEAR 1884-85.

—	Revised Estimate for 1883-84.	Budget Estimate for 1884-85.	—
	Rs.	Rs.	
Grant for Works and Repairs	17,32,841	21,40,024	
Deduct items on which no charge for Establishment is admissible.			
Land compensation	83,095	1,50,865	
Grant for adjustment of the cost of investigating the Barur Tank Project originally charged to Protective Works	35	...	
Total, Deductions ...	83,130	1,50,865	
Net Grant ...	16,49,711	19,89,159	
A. 23 per cent. on the Net Grant	3,97,431	4,57,506	
Direct Revenue	1,47,560	1,49,400	
B. 10 per cent. on Direct Revenue	14,756	14,940	
Indirect Revenue exclusive of the share of enhanced Land Revenue	31,33,000	31,46,000	
C. 6 per cent. on Indirect Revenue	1,87,980	1,88,760	
D. Cost of Establishment employed in investigating the Barur Tank Project	694	...	
Total, A + B + C + D ...	5,82,861	6,61,206	

GOVERNMENT OF MADRAS.

PART V.

DETAIL OF ESTIMATED CHARGES FOR ESTABLISHMENT BY SYSTEMS OF CANALS FOR THE YEAR 1884-85.

—	Establishment Charges. 23 per Cent. on the Grant for Works and Repairs, exclusive of Land Compensation. Grant.	Percentage.	10 per Cent. on Direct Revenue. Estimated Revenue.	Percentage.	6 per Cent. on Indirect Revenue. Estimated Revenue.	Percentage.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.							
51. IRRIGATION AND NAVIGATION.							
Imperial.							
Godávari Delta System	3,49,984	80,496	...	...	...	...	80,496
Kistna do. do.	3,93,097	90,412	...	...	...	...	90,412
Sangam Anicut System	4,20,000	96,600	...	...	...	...	96,600
Cauvery Delta System	1,99,000	45,770	...	...	...	...	45,770
Srívaikuntham Anicut System ...	24,216	5,570	...	...	...	...	5,570
Barur Project	69,000	15,870	...	...	...	...	15,870
Total ...	14,55,297	3,34,718	...	...	...	...	3,34,718
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.							
38. IRRIGATION AND NAVIGATION.							
Imperial.							
Godávari Delta System	1,95,000	44,850	79,000	7,900	14,90,000	89,400	1,42,150
Kistna do. do.	1,71,000	39,330	50,200	5,020	8,24,000	49,440	93,790
Pennér Anicut System	5,576	1,282	200	20	1,10,000	6,600	7,902
Kurnool-Cuddapah Canal	1,71,000	39,330	10,000	1,000	70,000	4,200	44,530
very Delta System	— 20,154	— 4,635	8,000	800	5,60,000	33,600	29,765
utham Anicut System ...	11,440	2,631	2,000	200	92,000	5,520	8,351
Total ...	5,33,862	1,22,788	1,49,400	14,940	31,46,000	1,88,760	3,26,488
Grand Total ...	19,89,159	4,57,506	1,49,400	14,940	31,46,000	1,88,760	6,61,206

GOVERNMENT OF MADRAS.

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PART VI.

DETAIL OF THE BUDGET ESTIMATE FOR EXPENDITURE ON TOOLS AND PLANT FOR THE YEAR 1884-85.

—	Budget Estimate, 1884-85.	Budget Estimate, 1883-84.
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.	Rs.	Rs.
51. IRRIGATION AND NAVIGATION.		
Imperial.		
Godavari Delta System.		
9. Navigation Plant—		
Eastern Division	...	3,000
Pumps and Machinery for baling water	2,000	3,200
Central Division	1,000	3,800
Western Division, Ferry boat	3,000	3,000
12. Miscellaneous—		
Eastern Division	504	500
Central do.	1,000	1,000
Western do.	...	500
Total ...	7,504	15,000
Expenditure in England ...	...	3,200
Do. in India ...	7,504	11,800
Total, Godávari Delta System ...	7,504	15,000
Kistna Delta System.		
Eastern Section.		
12. Miscellaneous—		
Floating Plant—Ten Archimedean Screws	...	2,400
Do. Pumps and English Stores	...	14,300
Do. Six Composite Punts	15,088	14,640
Total ...	15,088	31,340
Expenditure in England ...	...	14,300
Do. in India ...	15,088	17,040
Total, Kistna Delta System ...	15,088	31,340
Sangam Anicut System.		
Machinery (Expenditure in India)	11,400	5,000
Total, Sangam Anicut System ...	11,400	5,000
Barur Project.		
Tools (Expenditure in India)	630	...
Cauvery Delta System.		
Enamelled iron gauges	4,000	...
Tools	4,230	...
Total ...	8,230	...
Expenditure in England ...	4,000	...
Do. in India ...	4,230	...
Total, Cauvery Delta System ...	8,230	...
Srivaikuntham Anicut System.		
Tools (Expenditure in India)	268	...
Total, Capital Account ...	43,120	51,340

GOVERNMENT OF MADRAS.

PART VI—continued.

DETAIL OF THE BUDGET ESTIMATE FOR EXPENDITURE ON TOOLS AND PLANT FOR THE YEAR 1884-85—*continued.*

—	Budget Estimate, 1884-85.	Budget Estimate, 1883-84.
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.	Rs.	Rs.
38. IRRIGATION AND NAVIGATION (WORKING EXPENSES).		
Imperial.		
Godavari Delta System.		
Eastern Division.		
9. Navigation Plant—Staff boats	2,000	1,500
12. Miscellaneous—Tools	500	300
13. Repairs and Carriage—Maintenance of Navigation plant including existing ferries	14,000	15,000
Do. do. Special repairs to do.	3,787	5,000
Do. do. License fees	4,000	5,000
Do. do. Machinery	500	500
Total ...	24,787	27,300
Central Division.		
13. Repairs and Carriage of Navigation Plant, &c.	1,000	1,000
Western Division.		
13. Repairs and Carriage—Repairs of ferry boats and replacement of worn out existing boats by new ones	2,000	1,500
	27,787	29,800
Deduct probable estimate of decrease to Capital and Profit on account of the Dowlaishweram Workshop	...	11,500
Total, Godávari Delta System ...	27,787	18,300
Kistna Delta System.		
Eastern Section.		
9. Navigation Plant—Steamer	8,000	...
13. Repairs and Carriage—Maintenance of floating plant	10,611	8,855
Do. do. Special repairs to do.	4,000	4,645
Do. do. License fees of Government floating plant	2,500	1,500
Total ..	25,111	15,000
Western Section.		
9. Navigation Plant—Ferry Ballacuts	259	...
13. Repairs and Carriages—Maintenance of ferry ballacuts	400	...
Do. Tools	600	...
Total ...	1,259	...
Total, Kistna Delta System ...	26,370	15,000
Penner Anicut System.		
12. Miscellaneous—Four Archimedean screws	797	...
Kurnool Canal.		
13. Repairs and Carriage—Special Repairs to floating plant	4,772	4,386
Cauvery Delta System.		
13. Repairs and Carriage—Tools	308	...
Srivaikuntham Anicut System.		
13. Repairs and Carriage—Tools	206	...
Total, Revenue Account ...	60,240	37,686

Revenue Department
Proceedings of the Madras Government 179
Read the following G.O. Public Department, dated 18th March 1884, Mis No 553.

Ordered that the following telegram be forwarded to the Collector of Trichinopoly

"If Twigg has not left the district inform him that he has been permanently exempted from Survey and Settlement duty and is to join Malabar when Yate returns".

Order thereon, 2nd April 1884 No 1457

Communicated to the Board of Revenue, the Director of Revenue Settlement and the Superintendent of Revenue Survey.

(True Extract)

(Signed) H. E. Stokes

Secretary to Government

To
The Board of Revenue
" Director of Rev. Sett. and Agriculture
" Superintendent, Rev. Survey

(True Copy)

No 1100/5 Communicated to the Deputy Director of Revenue Settlement No III Party.

W. Wilson
Director of Rev. Sett. & Agriculture

Dept of Rev. Sett. and Agriculture Madras
5th April 1884

1884

From

THE DIRECTOR OF REVENUE
SETTLEMENT AND AGRICULTURE,
Madras,

To

The Dy. Director of
Revenue Settlement
No. III Party

Dated 5
Despatched 8 } April 1884.
Received

No. 1100/58

ENCLOSURES.

Subject.

Communicating copy of G. O.
No. 553 A. dated 18th March 18
ordering to forward a telegra
to the Collector of Trichin
that he may inform Mr. T
if he has not left the
District that he has been
permanently exempted
from Survey and settlement
duty.

Revenue Department

177

Proceedings of the Madras Government

Read the following Proceedings of the Financial Department, dated 26th March 1884, No. 672 Mis: on Endorsement of the Revenue Department, No. 1233 dated 17th March 1884, transferring Boards Proceedings, No. 2172 Mis:, dated 8th March 18[illegible] Submitting application of Collector of Nellore for the appointment of G. Venkataramiah as 12th English Accountant, Collector's office, whose age is above 25 years.

Resolution of the Board of Revenue

Submitted for the orders of Government.

2. It appears that the Accountant General reads G. O. 15th September 1879, No. 1772 as applicable to readmissions

to

to the Service of Government. The Board doubt the correctness of this interpretation: as apparently going beyond the direction at para 2 of letter from the Government of India to the Government of Madras dated 15th July 1871 printed in footnote to Section 70 Civil Pension Code 4th Edition.

Financial Department Order No. 2374 dated 13th December 1879 ruled that the prohibition was intended to apply to first admission to pensionable appointments. It is not considered that renewal of Sanction is necessary in the present case.

Order thereon, 1st April 1884, No 1438

Communicated to the Board of Revenue, Director of Revenue Settlement and Agriculture, Superintendent

of

of Revenue Survey and Director of Botanical Gardens for information 178

(True Extract)
(Sd) H. E. Stokes
Secy: to Govt.

No. 1110 A.

Communicated to the Agricultural Reporter, the Inspector of Cattle Diseases and Settlement parties.

Depth. of Reve: Settt. & Agriculture Madras 7th April 1884 } (signed) W. Wilson Director of Reve. Settt. & Agriculture

(True copy)
[illegible]
Assistant

To,
The Deputy Director
No. III Party

E. V. S.

17TH MARCH 1884, No. 391, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 18th February 1884, No. 549:—

Read—the following G.O., dated 24th January 1884, Mis. No. 125, Public:—

Read—the following Resolution of the Government of India, Cir. No. 1 Ex., dated 3rd January 1884:—

ABSTRACT.—Forwards for consideration a revised scheme for the promotion of trade in Indian products and industrial arts, prepared after discussion by the Committee convened in Circular No. 78 Ex., dated the 5th October 1883.

Order—dated 24th January 1884, Mis. No. 125, Public.

The foregoing resolution will be communicated to the Revenue Department and to the Superintendent, Government Central Museum, and the Superintendent, School of Arts, in continuation of G.O., dated 2nd June 1883, No. 1084, for an early expression of opinion on the revised scheme for the promotion of trade in Indian products and industrial arts.

(True Extract.)

(Signed) E. F. WEBSTER,
Chief Secretary.

To the Revenue Department, with copy of Cir. No. 1 Ex.

Endorsement, dated 29th January 1884, No. 439.

Referred to the Board of Revenue for early remarks, after consultation with the Director of Revenue Settlement and Agriculture.

(Signed) H. E. STOKES,
Secy. to Govt., Rev. Dept.

To the Board of Revenue, with copy of G.O., 2nd June 1883, No. 1084, Public.

Resolution—dated 18th February 1884, No. 549.

The Fourth Member of the Board was present at, and took part in, the discussions of the meeting of the Art Committee held in Calcutta on the 22nd December 1883, so is in a measure responsible for the draft scheme for the promotion of industrial art in India. The Fourth Member has recorded a minute on this subject in which he repeats the suggestion already made in Board's Proceedings, No. 486, dated 13th February 1884, that a new museum be erected on the vacant ground near the Teynampet toll-bar where it is proposed to hold agricultural exhibitions.

2. The Board do not oppose the idea of erecting a museum on that site for economic products which would fitly supplement the agricultural exhibitions, but they consider that Egmore is a very much more convenient situation for a museum of general interest, and they would not support any proposal to move the present museum to Teynampet.

3. The Board, while approving generally of the draft scheme as finally revised, doubt the expediency of the interference proposed in paragraphs 5 and 6. They are of opinion that if any interference at all is required, the Superintendent of the Museum should himself be the channel of communication between the public and workmen who may not be in a position to deal with customers at a distance. They are, however, disposed to doubt if any such workmen are to be found in this presidency, so keenly alive are the Madras workmen to their own interests. The Board are of opinion, therefore, that the officer in charge of the museum should himself place the customer in communication with the manufacturer or obtain and forward the desired specimens of art-ware. To establish a non-official agency would needlessly raise the price of art-ware.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department, with original Government Order of Public Department, returned.

Copy to Director of Settlement and Agriculture.

Read—official memorandum from J. D. REES, Esq., Acting Under-Secretary, Public Department, dated 1st March 1884, No. 474.

ABSTRACT.—Requesting an early reply to G.O., 24th January 1884, Mis. No. 125, Public.

Read—also Proceedings of the Board of Revenue, dated 11th March 1884, No. 1155, Routine.

ABSTRACT.—Forwarding copy of the minute recorded by the Fourth Member of the Board of Revenue.

ORDER—dated 17th March 1884, No. 391, Revenue.

Miscellaneous.

Communicated to the Public Department, with reference to G.O., Public, 24th January 1884, No. 125 Mis., with the remark that the Government in this department concur in the opinions expressed in paragraph 3 of the Board's proceedings.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Public Department.
,, the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. A. Aubert.

70 Copies.

In the order of 1884

Govt. of {1884} Madras.

REVENUE.

No. 974

Issued

Recd. Encl.

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases

Dept. of Rev. Sett. & Agre. Madras 15th April 1884

(By order)

[signature]

1st. Assistant

G.O., 17th March 1884, No. 391.

To

The Dy Director of Rev. Settt Party No. III

MARCH.

Trade in Indian Products and Industrial Arts.

Board's proceedings relative to the revised scheme for the promotion of —, communicated to the Public Department with remarks.

24TH MARCH 1884, No. 428, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—Extract from the Proceedings of the Government of India, Revenue and Agricultural Department, dated Calcutta, the 10th March 1884, Circular No. 35 A. (Agriculture).

Read—the following papers :—

Volume of selected correspondence containing besides other papers—

(1) Despatch from the Secretary of State, No. 30, dated the 17th February 1881, and enclosures.

(2) Resolution of the Government of India, No. 7—152—165, dated the 14th May 1881.

(3) Report by McDougall Brothers, of London, dated the 15th December 1882.

(4) Replies of Local Governments and Administrations to the above-mentioned resolution.

Further replies from Local Governments and Administrations and Native States to separate inquiries of the Government of India, dated the 12th March 1883.

Resolution—

In 1880 a large collection of the many varieties of Indian wheats was made in this country and sent to the India Office for examination and report by a commercial expert. In communicating the results of this valuation to the Government of India, the Secretary of State asked for some description of the nature of the soils in which the better classes of Indian wheats are grown, and of the system of cultivation followed. More particularly His Lordship inquired whether the best wheats were grown on irrigated or on unirrigated ground; whether the land had long been cultivated with wheat crops, and what was the average weight of crops per acre. It was also suggested that evidence should be collected to test the truth of the not unfrequent allegation that the productive power of the soil in some parts of India has begun to fail.

2. The replies of local Governments to this requisition have now been received, and are considered sufficiently interesting to be published for information. They contain an elaborate, if not exhaustive, enumeration of the wheats grown in the several provinces, with some notice of the qualities of the different classes. They also indicate the nature of the soils in which the best varieties are grown and the various methods of cultivation adopted. And they throw some light on the much disputed question, whether the general tendency of Indian agriculture is to exhaust the soil.

3. It is quite impossible to reduce the numerous varieties of wheats mentioned in the replies to a uniform and scientific classification. Every district has its own names, and even if the same names are used over an extensive tract, they are often found, as is remarked in a recent work in which the subject is carefully examined,* "to be applied in different places to totally different varieties." Sometimes the name

* *Field and Garden Crops*, by Duthie and Fuller, Roorkee College Press, 1882.

denotes the color or texture of the grain; sometimes a peculiarity of the ear or stalk or the character of the cultivation. But more often it is merely descriptive of the locality in which the grain is produced, or from which it is supposed to have first come. All varieties, whatever be the local names, may be primarily classed as white or red, hard or soft, and this four-fold grouping is recognised in the European trade. Adopting this classification it appears that the soft white wheat, which commands the highest price in the English markets, is grown to great perfection in Northern India, Rajputana, and Guzerat, and is commonly known under the names of *daudi* or *daudkhani*. It prefers a rich loam soil, well manured and irrigated, and a moderately severe winter. Soft red wheat ranks next in order of value in the European markets. Numerous varieties of this class are common in Northern India, and it is often sown intermixed with barley or gram. But the most valuable variety, under the name of *pissi*, comes from the Central Provinces, especially from the Narbada valley. The predominant soil in this tract is a heavy black loam or "cotton" soil, which, owing to its fertility and its capacity of retaining moisture, will produce excellent crops in years of average rainfall without manure or irrigation. Of the hard wheats, the white variety is much prized by natives. It is less known in Northern India than in the Deccan and Southern Mahratta country. More delicate than the hard red wheat, it requires careful cultivation and irrigation. Hard red wheats also are little known in Northern India; but under the title of *kathia* wheats they form the predominant class in Rajputana, the Central Provinces, and the Bombay Presidency. They are preferred to the soft wheats for consumption by the natives, and up to recent years commanded a higher price. The European demand for soft wheats has, however, brought the class of soft wheats, of which *pissi* is the best known variety, into greater favor with the cultivator. In the Central Provinces it was once not uncommon, it is said, for a ploughman contracting for service to stipulate that he should not have to eat *pissi* wheat more than twice a year. "Now a ploughman who demanded it twice would certainly not receive it," as its price is now at least 5*s*. a quarter higher than that of the hard wheats. This is an interesting illustration both of the care with which the native cultivator selects his seed and of the quickness with which he adapts himself to the changes of the markets.

4. A reference to Messrs. McDougall and Co.'s report* on experiments, conducted by them with Indian wheats on behalf of the Secretary of State, will show that they assigned the first place in order of merit to the soft white wheats and the second to the soft red. The former is on a par with English wheat and the best colonial wheats. The soft red wheats are 4*s*. or 5*s*. the quarter less valuable. The information summarised in the preceding paragraph places the home of the former in the Punjab and the Meerut division of the North-Western Provinces, and of the latter in the Central Provinces.

* Printed at pages 135—176 of the Collection.

5. Wheat is very little grown in Madras, Burma, Assam, or Bengal (excepting Behar). A rough estimate of the wheat production of the chief provinces of British India and of the more important native States is given on the margin. The returns for native territory have been compiled from information obtained through political officers, and in the absence of accurate surveys or statistical agencies no great reliance can be placed in the figures.

		ACRES.
British India..	Bengal (Behar)	850,000
	North-Western Provinces and Oudh	6,200,000
	Punjab	7,000,000
	Central Provinces	4,000,000
	Bombay	1,600,000
	Berar	700,000
Native States..	Hyderabad	750,000
	Central India Agency ..	2,500,000
	Rajputana Agency	2,500,000
	Baroda	88,000

The estimate does not include the less important native States which are under the direct control of the local Governments, and should, for many reasons, be accepted as a minimum estimate. Wheat, it may be mentioned, is often grown as a mixed crop with other grains, and in all estimates of the wheat production a difficulty arises as to the inclusion or exclusion of such areas. In the North-Western Provinces, for example, two million acres are returned as being under these mixed crops, but for the purpose of this calculation they have been taken to represent only one million acres of wheat. Similar corrections are required in the figures for other provinces.

6. An estimate of the total wheat production of India is a still more difficult matter. But the papers under review contain a considerable amount of information on the subject, and the general conclusions to which they lead may be briefly indicated. Any calculation based on a single standard of outturn would be obviously untrustworthy. The widely varying skill, energy, and resources of the cultivator, the many varieties of soil, of climate, and other physical conditions that are met with throughout the empire, make a single standard an impossibility. But approximate estimates of the yield of the chief classes of land in each province can be given, and from them some idea can be formed of the total average outturn. The figures in the margin are offered as a slight attempt in this direction. They are confined to British India, as the information for native States is extremely imperfect. The first class would include lands of average good quality, manured and irrigated. The second class, lands of fairly good quality, and of which the cultivation is so far careful that it includes either manuring or artificial watering. The third, lands of an inferior quality, and lands which, from some cause or other, are inefficiently or carelessly cultivated. The average shown for each province is not a strict arithmetical average, as in settling it the relative importance of the three classes in each province had to be borne in mind. The highest provincial average is assigned to the North-Western Provinces and Oudh, as owing to the density of population, the laborious instincts of the lowest classes and the spread of canal irrigation, a greater area of land is believed to fall there into the first category than in even the fertile plains and riverain valleys of the Punjab. In the Central Provinces the agriculturist is less skilful, farms are larger, and the cultivation generally much more careless. Irrigation and manure are little known, and only soil as rich in natural properties as the deep black loam of the Narbada valley could stand the exhausting treatment to which it is subjected. In the Berars the best lands are given up to cotton, and wheat is a secondary crop to which comparatively little labor and care is given. In Bombay the yield of the richest lands in Guzerat is probably unsurpassed in India, but in the Deccan there is a large amount of poor land which greatly reduces the average outturn of the Presidency. As regards native States, it is safe to state that the yield per acre in Hyderabad does not exceed, probably does not equal, that assumed for Berar, and that the Central India States are, in respect to the limited area on which wheat is grown, at least as productive as the Central Provinces. The Bhopal State, for example, the cotton-soil tract of Rewah lying north of the Kymores, and portions of the Gwalior territory, are very fertile, and can grow excellent crops of wheat without irrigation or manure year after year. For Rajputana a similar average might be assumed ; for, though the rainfall is scanty and means of irrigation few, yet there is a large amount of good wheat land in the more eastern States.

	Bushels per Acre.			
	Class I.	Class II.	Class III.	Average.
Punjab ...	20	11	$7\frac{1}{2}$	10
North-Western Provinces and Oudh.	22	15	9	13
Bombay ...	18	10	6	9
Central Provinces.	16	10	6	8
Berars ...	12	8	5	7

7. The broad result of this inquiry may be thus stated. The area under wheat in British India is about twenty million acres, and the yield between $5\frac{1}{2}$ and 6 million tons. The area in native territory would give an additional 6,000,000 acres, yielding about $1\frac{1}{4}$ million tons.

Of this $6\frac{3}{4}$ million tons or 135 million cwts., the quantity available for export to Europe must be a matter of the vaguest conjecture. It is known, however, that 15 million cwts. were exported for the twelve months ending 31st December 1882, and this has been followed by an export of $22\frac{1}{3}$ millions during the twelve months ending 31st December 1883. It is perhaps not unreasonable to suppose that when the railway system is more developed, one-fourth, possibly more, of the total outturn of $6\frac{3}{4}$ million tons will in good years be available for Europe. The country has other food-stuffs to fall back on if to export its wheat pays, and should the external demand materially raise the price of wheat compared with other food-grains, the poorer classes are prompt to contract their consumption of the dearer article. It is, however, to be noticed that in spite of the large export to Europe and of the partial failure of last autumn's

monsoon, the price of wheat is slightly lower now than it was two years ago.* The contraction of the export to $3\frac{1}{4}$ million cwts., for the three months ending 31st December 1883, has been due not to any rise in price in India, but to the low prices ruling in Europe. Wheat is still selling at $22\frac{1}{2}$ seers the rupee, or (allowing for exchange) about 18*s.* 6*d.* the quarter † at Jubbulpore—a price which gave a good margin for profit to the exporter when the London rate was 43*s.* the quarter, but not when, as now, the London rate has fallen to 40*s.* for the best English wheats, and to 33—36*s.* for Indian wheats.

8. The accounts given in the papers under review of the methods and cost of production exemplify the wonderful diversity of conditions under which wheat is raised. In the North-Western Provinces and parts of the Punjab manure and frequent waterings are thought essential to secure a good crop. In the northern districts of the Punjab the winter rains obviate in a great measure the necessity for irrigation, while in the Multan country and in Sindh the wheat crop depends on inundation canals drawn from the snow-fed rivers. In Rajputana what little irrigation exists is obtained from tanks and catchment basins, and the finest crops are sometimes seen in the dried-up beds of these reservoirs. In Central India and the Central Provinces and parts of Bombay, the moisture-holding cotton-soil, which everywhere predominates, and a heavier rainfall enable the ltivator to dispense with irrigation. The cultivation, as already said, is in these tr s far less careful in character than in Northern India, and both the cost of producti and the outturn is less.

9. Th actual cost of production, expressed in money, is a question often asked, but xtremely difficult to answer. The cultivator's outgoings in money are very small nd the primary result of his labor is a store of grain wherewith he feeds himse nd his family. What surplus there is goes to pay the rent, to provide seed and p gh. cattle, to meet irrigation and other farming dues, and to keep his household i lothes and other trifling necessaries and luxuries. To value his labor and its resu in cash is an operation involving many hypotheses. Of the many calculations ch have been made by experts, one may here be reproduced for what it is worth. Northern India, in a district traversed by railways, the cost of growing wheat on manured and irrigated land is said to be little under 1*s.*‡ a bushel or 8*s.* a quarter *usive* of rent, or *inclusive* of rent, 1*s.* 6*d.* the bushel or 12*s.* the quarter. This estimate ludes all charges, from the purchase of the seed to the threshing of the outturn. narket rate of 18*s.* 6*d.* a quarter would probably mean to the producer village es not exceeding 15*s.* or 16*s.* There would be a margin of profit (exclusive of alue of the straw) of 10*s.* the acre with an outturn of $2\frac{1}{2}$ quarters, and of 4*s.* the with an outturn of 1 quarter. The larger outturn may be considered that of well-ti and in Northern India; the smaller that of the half-cultivated lands of the Narbada ey. In the last named tract the cost of cultivation per acre is considerably less, per bushel of yield about the same. Large holdings and inefficient cultivation therefore go together, as 5 acres carefully tilled will yield as large a profit as ten acres under careless cultivation. But as holdings in the Narbada valley are six

‡ 8*d.* = 1 rupee.

* The following prices are taken from the fortnightly returns published in the *Gazette of India*. The seer = 2 lb. :—

Towns.	1882. First half of January.	1882. First half of April.	1882. First half of July.	1882. First half of October.	1883. First half of January.	1883. First half of March.	1883. First half of May.	1883. First half of July.	1883. First half of September.	1883. First half of October.	1883. First half of November.	1883. First half of December.	1884. First half of January.
	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.	Per Re. S. Ch.
Jubbulpore ..	20 0	20 8	16 8	17 8	18 8	18 0	..	19 0	19 0	21 0	22 0	22 12	22 8
Ahmedabad.	16 0	13 0	12 8	14 0	13 0	13 8	12 0	12 0	12 0	12 0	11 8	13 8	12 0
Agra ..	17 0	18 8	17 0	17 4	18 0	16 12	17 8	16 8	16 8	17 8	..	17 4	17 8
Cawnpore ..	19 0	21 0	17 4	18 0	18 4	18 8	19 0	18 0	18 8	18 12	..	19 8	19 8
Delhi ..	19 0	19 0	17 12	20 0	19 8	18 8	19 8	19 0	17 8	18 8	19 0	18 4	18 4
Lahore ..	21 0	23 0	23 0	26 0	25 0	24 0	23 0	23 0	20 0	22 0	23 0	23 0	23 0
Multan ..	16 0	17 0	16 12	17 4	17 0	17 0	16 4	17 0	15 8	16 0	16 0	16 8	17 0
Karachi ..	11 5	12 0	12 5	12 5	12 10	13 10	13 0	13 0	12 13	13 0	13 6	13 0	13 10

† The quarter is taken at 496 lb., and the bushel at 62 lb. or 31 seers.

and seven times the size of the average holding of an Oudh tenant, the agriculturist in the former locality may not get one-half as much off his land as the latter, and yet is in very much easier circumstances.

10. The alleged deterioration of the soil is the last point to which the Secretary of State has invited attention. The replies are, on the whole, encouraging. Frequent mention, it is true, is made of the popular belief that the soil has ceased to bear the rich crops which once rewarded the ploughman's toil. But the cases are exceptional in which this belief appears to embody a truth. Overcropping will of course exhaust any soil, and the rapid extensions of canals has undoubtedly encouraged the more improvident and poorer cultivators to overcrop. Irrigation always tends at the outset to outturn the manure supply, and this is one of the chief drawbacks to the many benefits derived by the country from canals. In the Narbada valley a falling off in the exuberant yield of the virgin soils has also been reported by careful observers. But when once the first riches of the land has been exhausted, a permanent, though lower, standard of outturn appears to be reached. The phenomenon is common to all newly-opened countries, and is not a matter which need excite either concern or astonishment.

11. The question of improving the cleanliness and condition of Indian wheats before export does not come within the scope of these papers. Many suggestions have from time to time been pressed on the Government, but the only action which it has been found possible to take is to distribute notices among the agricultural population pointing out the advantages to be obtained from the cultivation of wheat unmixed with other grains, and from the more careful preparation of the crop for the markets. The subject will continue to receive attention, though it is one in which more is to be looked for from the intelligent self-interest of the producer and the grain-merchant than from anything which the State is able to effect.

Order—

Madras.
Bombay.
Bengal.
North-Western Provinces and Oudh.
Punjab.
Central Provinces.
British Burma.
Assam.
Ajmere.
Coorg.
Secretary for Berar to Resident at Hyderabad.

Ordered that copies of the foregoing resolution be forwarded to the Local Governments and Administrations noted on the margin, and to the Foreign Department for communication to Political officers.

(True Extract.)

(Signed) T. W. HOLDERNESS,
Offg. Secretary to the Govt. of India.

To the Secretary to the Government of Madras.

Order—dated 24th March 1884, No. 428, Revenue.

Miscellaneous.

Communicated to the Board of Revenue, the Director of Agriculture, and the Chamber of Commerce.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.
,, Chairman, Chamber of Commerce.
,, Honorary Secretary, Nílgiri Planters' Association.
,, ,, ,, Wynaad do.
,, ,, ,, Yercaud do.
,, ,, ,, Madras Agri-Horticultural Society.
,, Editor's Table.

Exd. C. Howarth.

100 Copies.

Ir No. 1070/86

Govt. of {1884} Madras.

REVENUE.

No. 976

Issued

Recd. *Encl.*

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter

Dept. of Rev. Sett. & Agre. Madras 16 April 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Rev.
Settt. Party No. III

G.O., 24th March 1884, No. 428.

MARCH.

Indian Wheat.

Copy of the Government of India resolution regarding the cultivation of —, communicated to certain authorities and the Chamber of Commerce.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Order—dated 5th April 1884, No. 472, Revenue.

Miscellaneous.

During the absence of Mr. W. Wilson on leave, Mr. W. S. Whiteside, Acting 3rd Member of the Board of Revenue, will take charge of the office of Director of Revenue Settlement and Agriculture.

2. The Board will arrange under Act II of 1883 for the distribution, amongst the remaining members, of Mr. Wilson's work as 4th Member.

3. Mr. Whiteside will be gazetted to act as Inam Commissioner during Mr. Wilson's absence.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Accountant-General.
,, the Public Department.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

80 Copies.

Inw. No. 1074/84

Govt. of (1884) Madras.

REVENUE.

Fe. 1388

Issued

Recd.

Encl.

...ated to the Officers in charge of Settlement Parties, to ...ltural Reporter and to the Inspector of Cattle Diseases.

...ev. Sett. & Agre. }
~~April~~ May 1884 }

(By order)

[signature]
1st. Assistant

Director of Reve: Settt.
Party No. III

G.O., 5th April 1884, No. 472.

APRIL.

Director of Revenue Settlement and Agriculture.

Mr. Whiteside appointed to take charge of the office of — and to act as Inam Commissioner during Mr. Wilson's absence on leave, and the Board requested to arrange for the distribution, amongst the remaining members, of Mr. Wilson's work as 4th Member.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from Colonel H. T. Rogers, R.E., Superintendent, Madras Survey, to the Secretary to Government, Revenue Department, dated Madras, 11th February 1884, No. 37-G. :—

I have the honor to report that the undermentioned men, who were employed in the Nílgiri Survey Detachment, were convicted and sentenced by the Deputy Magistrate of Wynaad and are awarded punishments as specified against their names.

2. I beg to request that these individuals may be declared disqualified for further service under Government :—

Name of the Accused.	Rank.	Nature of the Offence.	Punishment awarded.
1. M. Mariadoss Pillai ...	Clerk ...	Misappropriation of public money.	18 months' rigorous imprisonment.
2. K. Kuppusawmy Naidu ...	Do. ...	Do.	1 year's rigorous imprisonment.
3. V. Sesha Iyengar ...	Demarcator	Receiving gratification other than legal remuneration.	Fine of Rs. 60, or 4 months' rigorous imprisonment.

No. 67.

OFFICIAL MEMORANDUM.

With reference to the letter from the Superintendent, Revenue Survey, No. 37-G., dated 11th February 1884, the undersigned is directed to enquire whether the sentences have become final, being confirmed on appeal, or appeal time having lapsed.

(Signed) H. E. STOKES,
Secretary to Government.

Fort St. George,
13*th February* 1884.

Read—the following letter from Colonel H. T. Rogers, R.E., Superintendent, Madras Survey, to the Secretary to Government, Revenue Department, dated Madras, 3rd April 1884, No. 85-G. :—

With reference to your Official Memorandum, No. 67, dated 13th February 1884, I have the honor to state that M. Mariadoss Pillai and K. Kuppusawmy Naidu appealed against the sentence of the Deputy Magistrate of Wynaad, but that the Appellate Court have confirmed the sentence; V. Sesha Iyengar preferred no appeal within the time allowed.

ORDER—dated 22nd April 1884, No. 523, Revenue.

Miscellaneous.

Ordered accordingly that the individuals named be declared disqualified for further service under Government.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Superintendent, Revenue Survey.
,, Board of Revenue.
,, Director of Revenue Settlement and Agriculture.
,, Inam Commissioner.
,, Director, Government Cinchona Plantations,
Parks and Gardens, Nílgiris.
,, Public Department.
,, Military Department.
,, Public Works Department.

Exd. A. Raitt.

150 Copies.

Inw No 1394/84

Govt. of (1884) Madras.

REVENUE.

No 1483

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre. Madras 10 May 1884

(By order)

Sheshagiri [signature]

1st. Assistant

To The Dy: Director of Reve: Settt Party No III

Issued

Recd. *Encl.*

G.O., 22nd April 1884, No. 523.

APRIL.

M. Mariadoss Pillai and two others

of the Revenue Survey Department.—Declaring — disqualified for further service under Government.

22ND APRIL 1884, No. 530, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from J. NUGENT, Esq., C.S., Secretary to the Government of Bombay, Revenue Department, to the Secretary to the Government of India, Revenue and Agricultural Department, Simla, dated Bombay Castle, 21st March 1884, No. 2503 :—

I am directed to forward herewith, for the information of the Government of India, a copy of two reports, received from Her Majesty's Secretary of State for India, by Mr. Frederic Moore, the well-known Indian Entomologist, on the specimens of locusts sent from Bombay to England for inspection and report by a skilled entomologist.

49 separately by book post.

CIRCULAR No. 43 (Famine).

Copy, with three spare copies of the enclosure, forwarded to the Government of Madras for information in continuation of the endorsement from this department, No. 41, of the 4th March last.

SIMLA,
8th April 1884.

(Signed) T. W. HOLDERNESS,
Under Secy. to the Govt. of India.

ENCLOSURE No. 1.

Letter from FREDERIC MOORE, Esq., late Assistant Curator, India Museum, London, to the Under Secretary of State for India, dated 110, Oakfield Road, Penge, London, S.E., 12th November 1883.

With reference to your letter of the 9th October last (R. S. & C., 2046), and its accompanying packages containing specimens of locusts from the Bombay Presidency, which were forwarded to me with the view of determining their scientific names, I have the honor to forward the following brief report thereon.

The specimens of locusts sent from Purandhar are representatives of three species, referable to the genera of *Acridium* and *Caloptenus*, and of which the following descriptions will serve for future identification :—

(1.) *Acridium succinctum*.—Front wings yellowish olive-brown, with broad darker brown streaks from the base between the middle veins, these streaks becoming slender and obliquely disposed toward tip of the wing. Hind wings pellucid, bright purplish-rose color towards the base. Body and legs olive-brown. Head smooth, with transverse blackish marble streaks; face keeled, black streaked, and with a yellow bead-like spot at upper end of outer keels, and a similar spot between the inner keels. Eyes oval, olive-yellow, black streaked. Antennæ yellow. Thorax roughly punctured, and with a slight dorsal keel, a blackish sub-dorsal streak, and a broad lateral front streak with a pale central streak. Abdomen brown. Front and middle legs olive-brown above, yellowish beneath. Hind femora nearly as long as the body, pale testaceous, tip sap green; hind tibiæ olivaceous, spines white with black points. Expanse of the wings four and-a-half to five inches.

(2.) *Caloptenus erubescens*.—Front wings reddish testaceous at the base, and pale brownish towards the tip, marked with numerous dark brown transverse streaks between the upper veins, the streaks being broad and macular from the base of the middle veins and then becoming transversely continuous towards the tip. Hind wings pellucid, pale purplish-rose color

towards the base. Body and legs testaceous. Head and prothorax with a broad indeterminate blackish stripe on each side. Head smooth, moderately long, tip of the vertex and front puncutred, transversely sub-elliptical, distinctly keeled, inner keels parallel, outer keels diverging slightly towards the face. Eyes elliptical, ferruginous. Antennæ slender, pale testaceous. Prothorax finely punctured, with an extremely slight middle keel and hardly perceptible lateral keels, transverse impressed line straight, fore border and sides slightly rounded, hind border much rounded. Prosternal spine very thick, not attenuated towards the tip, which is slightly truncated. Hind femora nearly as long as the abdomen, with a black longitudinal stripe along the outer side, and three strips along the upper part of the inner side; hind tibiæ pale testaceous, shorter than the femora, the spines with black points. Front and middle legs testaceous. Expanse of the wings nearly two inches and-a-half.

(3.) *Caloptenus caliginosus.*—Body and legs dark brown. Front wings brownish-ochreous, with large, broad, dark brown spots from the base, and smaller transverse spots towards the tip. Hind wings pellucid, slightly suffused with pink at the base. Head with pale ochreous streaks. Face keeled; the edges of the keels pale ochreous. Eyes oval, brown, with pale ochreous streaks in front. Antennæ ochreous. Thorax above scabrous, punctured at the sides; top and sides keeled; the edges of the keels pale ochreous; a black spot with ochreous centre on each side. Abdomen dark brown, with ochreous segmental bands. Hind femora very broad, dark brown, paler beneath, the ridges on outer side prominent, upper ridge with short black spines, the latter ridges spotted alternately with black and ochreous, tip black streaked, inner side paler, with a broad black streak along the middle; hind tibiæ pale brownish-ochreous, with black tipped spines. Front and middle legs ochreous-brown. Expanse of the wings two inches and-a-half.

The specimens forwarded from Násik and Sholápur are also referable to the species No. 1 above described, namely, *Acridium succinctum.*

Those from Sirur Táluka (referred to in letter from Revenue Department, No. 71, dated 4th September 1883), are quite different from either of the above, and are representatives of the species of the genus *Syrtacanthacris*, namely,—

(4.) *Syrtacánthacris ranacea.*—Front wings olivaceous brownish-ochreous, with two large well defined dark brown basal spots, followed by an inward oblique constricted spot, a lengthened spot, and thence to the tip by several outwardly oblique short spots. Hind wings pellucid, yellowish. Body and legs olivaceous brownish-ochreous. Head smooth. Eyes brown. Face slightly punctured, keeled, the bead-like spots facetted. Thorax numerously covered with minute raised tubercles on the top, and punctured at the sides, with a whitish dorsal streak and lateral quadrate spot, the latter blackish along its upper edge. Hind femora with dark brown ridges and transverse streaks; tip black; tibial spines long and black tipped. Front and middle legs brownish-ochreous. Expanse of the wings four and three-quarter inches.

Any papers containing reports of the occurrence of locusts, or other insect pests in India, that I could be favored with, would greatly interest yours, &c.

Enclosure No. 2.

Letter from FREDERIC MOORE, Esq., late Assistant Curator, India Museum, London, to Sir G. M. BIRDWOOD, c.s.i., dated 110, Oakfield Road, Penge, London, S.E., 31st December 1883.

In continuation of my remarks upon the specimens of locusts, referred to in letter R. S. & C. No. 2046 of 1883, forwarded from Bombay, which were sent to me for examination and the identification of their scientific names, I have the honor to submit the following note upon Dr. Macdonald's letter, No. 502, dated Bombay, 22nd October 1883, and which were subsequently also sent to me for the same purpose. The object for which these specimens of locusts have been forwarded to England being simply for the purpose of ascertaining their scientific names, my examination of them results only in supplying that information.

The specimens contained in the nine small bottles, with the exception of the single specimen noted at the end of paragraph 2 of Dr. Macdonald's letter, are all representatives of one species of the family of *Acridiœ*, namely, *Oxya furcifera*, and of which the following is a description for future identification.

Oxya furcifera.

Adult.—Grass green, head smooth at the sides, and with a few slight strigæ above; face broad, punctured, with four keels, two central and one lateral, a small bead-like spot between the middle keels and a similar spot on each lateral keel above the antennæ; vertex prominent, depressed above, convexly angular in front; eyes brown, lateral, remote, prominent, oblique; antennæ ringed with black; thorax very finely punctured, traversed by four transverse slender black striated lines the two posterior lines extending to near the lateral edge, third line short, dorsal, the anterior line interrupted above; abdomen brown along the dorsal keel. Hind

femora long, extending to end of the abdomen, ridged above and beneath on both sides, laterally thickened to the base and with transverse angular strigæ; knees black streaked; hind tibia nearly as long as the femora, bluish, with two rows of strong black-tipped spines above and four single spines at the end; tarsal pads large; fore and mid legs slightly punctured; tibiæ slightly spined beneath. Front wings grass green, reticulated; hind wings pellucid, reticulated, prominent veins brown towards the base.

Expanse of wings, male 2, female 3 inches.

The reported statement at the end of paragraph 3 of Dr. Macdonald's letter, that *immature* pairs of these locusts breed, cannot be true. The act of perpetuating the species cannot be effected before the insects have reached the adult stage. The eggs contained in the abdomen of the female are formed during the pupal stage, and are not susceptible of fecundation during that stage of the insect's life. The eggs, noted as having been actually laid by an *immature* female, whilst confined in a box, were only exuvial pellets.

Order—dated 22nd April 1884, No. 530, Revenue.

Miscellaneous.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. C. Howarth.

80 Copies.

Ins No. 1352/84

Govt. of {1884} Madras.

REVENUE.

No. 1206

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre. Madras 10 May 1884 (By order)

[signature]
1st. Assistant

To
The Dy: Director of Reve:
Settt. Party No. II

Issued

Recd. *Encl.*

G.O., 22nd April 1884, No. 530.

APRIL.

Locusts.

Copies of an entomologist's report on speci mens of — sent by the Bombay Government to England, communicated to certain authorities.

26.5.84 / C.I. / P. Pos. 189

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 2nd April 1884, No. 1195 :—

Read—the following letter from T. W. HOLDERNESS, Esq., C.S., Officiating Secretary to the Government of India (Revenue and Agricultural Department—Statistics), to the Secretary to the Government of Madras, dated Calcutta, 4th March 1884, Circular No. 29 (Statistics); and endorsement by H. E. STOKES, Esq., Secretary to Government, Revenue Department, dated 18th March 1884 :—

In continuation of my letter No. 22 (Statistics), dated the 13th ultimo, forwarding copy of the Proceedings of the Statistical Conference, I am directed to invite attention to the Resolution noted on the margin, and to ask to what extent effect can, in the opinion of His Excellency the Governor in Council, be given to it in the Madras Presidency.

Resolution (3) *of* 21*st December* 1883 (*page* 10 *of Proceedings*).

"*Resolved*—Also, with a view to increase the utility of the system of road registration for public works purposes, as conducted in the North-Western Provinces and Central Provinces by a small moveable establishment under the Director of Agriculture, that the Conference is of opinion that the Department of Public Works of the Government of India should supply the Revenue Department of the Government of India with an annual forecast on 1st January every year of the routes, with respect to which it is most likely that early information will be required for all railway projects. Unless some such system is adopted, the Agricultural Department of the Provincial Governments may very possibly not be in a position to comply with unexpected requisitions for such statistics."

2. It has been ascertained that the Public Works Department of the Government of India is prepared to supply the forecast on the 1st July in each year, that date being considered more suitable than the 1st January—the date mentioned in the Resolution. The Government of India, in the Revenue and Agricultural Department, would communicate the forecast to the Governments of the different Provinces to which any portion of it applied, and it would rest with the latter to take such steps as they might consider necessary to arrange for the special registration of the road traffic along the routes mentioned in the forecast, and to have the results examined and reported on by the Agricultural Department of the Province.

3. It is anticipated that such arrangements can be readily made in Provinces where an Agricultural Department exists and where the work of traffic registration has already been assigned to it. Where this is not the case, the recommendations of the Conference will not be applicable without some modification. Before directing the annual preparation of the forecast, the Government of India will accordingly be glad to learn the views of local Governments.

Endorsement, Mis. No. 1263.

Referred to the Board of Revenue for early remarks, in consultation with the Director of Revenue Settlement and Agriculture.

Resolution—dated 2nd April 1884, No. 1195.

The Proceedings quoted in paragraph 1 of the letter from the Officiating Secretary to the Government of India have not been communicated to the Board, but from the extract given in the margin of the letter, it would appear that the statistics of road traffic referred to by the Government of India are required in connection with railway projects. In a recent G.O., (dated 21st February 1884, No. 253), this Government decided that the registration of road traffic in the neighbourhood of certain projected lines of railways in this Presidency should be done by Collectors under the control of the Board of Revenue, and instructions have accordingly been issued to give effect to their order (*vide* Board's Proceedings, dated 22nd March 1884, No. 1062).

2. The Board have consulted the Director of Agriculture, and are of opinion that similar arrangements could be made for registering the traffic on any other routes regarding which information may be required by the Public Works Department of the Government of India. It is presumed that the cost of such temporary establishment as may be found necessary will be debited to the Public Works budget.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department.
,, the Director of Revenue Settlement and Agriculture.

Order—dated 2nd May 1884, No. 582, Revenue.

Miscellaneous.

Ordered that the following letter be despatched to the Government of India:—

(Here enter No. 583, dated 2nd May 1884.)

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Public Works Department, Railway Branch.

Exd. W. H. French.

90 Copies.

Inw No 1404/84

Govt. of {1884} Madras.

REVENUE.

No 1288

Issued

Recd. *Encl.*

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 21st May 1884

(By order)

[signature]
1st. Assistant

to
The Dy. Director of Revn.
Settl. Party No III

G.O., 2nd May 1884, No. 582.

MAY.

Traffic Satistics.

Letter regarding direction and tabulation of—, ordered to be forwarded to the Government of India.

190

No. 4541 G., dated Abu, 28th November 1883.

From—~~Captain E. A. Fraser~~, Agent to the Governor General in Rajputana,

To—The Secretary to the Government of India, Foreign Department.

In reply to your letter No. 2868I., dated 26th September 1883, calling for any available information regarding the State grass preserves in Ulwar, I have the honour to submit copy of a letter No. 579G., dated 22nd November 1883, from the Political Agent, Ulwar, furnishing the required information, together with the sketch map referred to therein.

No. 519 G., dated 22nd November 1883.

From—Lieutenant-Colonel H. P. Peacock, Political Agent, Ulwar,

To—The First Assistant Agent to the Governor General in Rajputana.

In answer to your endorsement No. 3693 G., dated 3rd October 1883, regarding grass preserves of this State, I have the honour to submit the following information supplied by the Ulwar Durbar. I much regret the delay which has taken place; it was unavoidable, however, for it was not wished that any but reliable information should be submitted, hence the necessity of frequent references to the different Tehsils. A map, too, showing the situation of these grass preserves had to be prepared.

2. The tracts of land reserved by this State for grass are called "roonds." They are fifty-one in number, and cover an area estimated at 367,760 bigahs, or 2,45,173 acres of land. A statement showing the names and areas of these "roonds" and a map showing their situations are herewith appended. These "roonds" are found on the tops of hills forming table land on the sides of hills, and in the plains, and are most numerous round about the city of Ulwar and in the south-west of the State.

3. The average yield of one cutting of grass after the rains is, at the lowest calculation, six maunds per bigah (60 × 60 yards) or 2,206,560 maunds for the whole State.

4. After the grass has been cut, permission is granted to the neighbouring villages to graze their cattle upon these "roonds" on the payment of a small fee, which varies from one anna to eight annas, according to the description of cattle, per season, from November to June. So much grass only as is considered necessary for the requirements of the State is annually cut. Surplus "roonds" are let out on contract.

The cutting of the grass is generally arranged for by contract at fixed rates given to neighbouring villages.

5. In addition to grass these "roonds" supply roots, and various bushes and shrubs and leaves of the *salar* and *dhok* trees, all of which serve as fodder during a cattle famine in seasons of drought. In such seasons, however, these "roonds" do not afford sufficient protection against cattle famine as they are all unirrigated.

6. The total number of cattle in the State is 791,446, of which 308,289 are goats and sheep, and 483,157 are cows, oxen and buffaloes.

7. During a drought a square mile of "roond" yields about 860 maunds of grass root, and with the shrubs and bushes, &c., &c., before mentioned, this area would protect 40 head of cattle for three months.

8. The method adopted in this State for storing grass is as follows. The grass is dried and carted to some convenient place, where it is bound into sheaves or bundles and stored in ricks. A rick of the following dimensions is annually made in Ulwar, and is the largest made—190 feet in length, 90 feet in breadth, and 40 feet in height. This is supposed to store some 60,000 maunds of hay. A thatch is placed over this rick to protect it from rain. Stocked and protected in this way, hay has been found to keep for five years.

Statement of "roonds" or grass reserves in the Ulwar State.

Number.	Pergunnah.	Name.	Villages surrounding the "roond."		Area in bigah or $\frac{2}{3}$rd of an acre.	Situation of "roond": On the top of hills.	Situation of "roond": In the plains.
1	Kathumbar ...	Maithna	1 Tasai ...	2 Rahti ...	......	......	......
			3 Burka ...	4 Maithna ...	1,340$\frac{1}{2}$	......	In plain.
2	Ditto ...	Sonkhri	1 Nagla Madhopur ...	2 Sonkhri ...	226$\frac{3}{5}$	......	Ditto.
3	Ulwar ...	Khusalgurh	1 Madhogurh ...	2 Baletta ...	......	......	......
			3 Kiraska ...	4 Indok ...	3,151$\frac{1}{5}$	On the hill ...	......
4	Ditto ...	Nihdani	1 Dhoulidub ...	2 Ballonbora ...	......	......	......
			3 Ulwar ...	4 Moncha ...	202$\frac{13}{20}$	Ditto ...	......
5	Ditto ...	Nithbahan	1 Naithla (jagir village)	2 Nithbahan ...	496$\frac{2}{5}$	......	In plain.
6	Ditto ...	Madhogurh	1 Madhogurh ...	2 Kali Khosh ...	......	......	......
			3 Bairabas ...	4 Natusar (p. Bansur)	1,440$\frac{1}{2}$	1,209$\frac{19}{20}$	230$\frac{11}{20}$
7	Ditto ...	Hajipur	1 Bala Dahra ...	2 Shahpur ...	......	......	......
			3 Dadikar ...	4 Hajipur ...	3,993$\frac{3}{20}$	......	In plain.
8	Ditto ...	Dhailowas	1 Sirawas ...	2 Rampur ...	......	......	......
			3 Nathusar ...	4 Binak ...	1,496$\frac{3}{10}$	On the hill ...	......

9	Ditto ...	Kiraska	1 Buletta ...	2 Dhouri (p. Rajgurh)	......	......	......
			3 Kiraska ...	... ...	$1,514\frac{3}{10}$	Ditto ...	......
10	Ditto ...	Bhankera and Liwari ...	1 Ulwar ...	2 Bhankera ...	......	......	
			3 Liwari ...	4 Bar Kaisarpur ...	$10,013\frac{13}{20}$	$10,006\frac{3}{5}$	$6\frac{9}{10}$
11	Ditto ...	Khuntaita	1 Basgujar ...	2 Kharkhara ...	$1,383\frac{1}{10}$	$118\frac{3}{10}$	$1,264\frac{4}{5}$
12	Ditto ...	Binak	1 Dhailawas ...	2 Bakhtpur ...	$15,338\frac{17}{20}$	$11,229\frac{3}{5}$	$4,109\frac{1}{4}$
13	Ditto ...	Sirawas	1 Rampur ...	2 Hajipur ...	$13,684\frac{3}{10}$	$7,613\frac{3}{5}$	$6,070\frac{7}{10}$
14	Ditto ...	Dadikar and Kishenpur ...	1 Dadikar ...	2 Ghaigholi ...	$7,239\frac{3}{20}$	On the hill ...	......
15	Ditto ...	Balletta	1 Pirthipur ...	2 Balletta ...	$10,010\frac{1}{5}$	Ditto ...	......
16	Ditto ...	Pirthipur, &c.	1 Kharetta ...	(p. Mandawar).			
		Shahpur	2 Khanpur ...	... ...	23,224	Ditto ...	......
17	Ditto ...	Indouk	1 Siriska ...	(p. Thana Ghazi). ...	Area included in the total of unmeasured area.	Ditto ...	
			2 Doharbola ...	... ...	......	......	......
18	Thana Ghazi ...	Seli Beri	1 Rajour ...	2 Haripur ...	8,187	Ditto ...	......
19	Ditto ...	Suratgurh	1 Jhiri ...	2 Suratgurh ...	713	Ditto ...	......
20	Ditto ...	Hamirpur	1 Partapgurh ...	2 Kalair ...	920	Ditto ...	......
21	Ditto ...	Jhiri	1 Bhuriawas ...	1 Partapgurh ...	2,929	Ditto ...	......
22	Ditto ...	Bijpuri	1 Chahakabas ...	2 Lalpura ...	$99\frac{1}{4}$	Ditto ...	......

Statement of "roonds" or grass reserves in the Ulwar State.—contd.

Number.	Pergunnah.	Name.	Villages surrounding the "roond."	Area bigah or $\frac{2}{3}$rd of an acre.	Situation of "roond." On the top of hills.	Situation of "roond." In the plains.
23	Thana Ghazi ...	Madhogurh	1 Malwa ... ... (Raj Jeypur).			
			2 Kailakabas ... (Ditto) ...	$526\frac{1}{2}$	On the hill ...	......
24	Ditto ...	Angar	1 Angari ... 2 Bhanouta ...	1,090	Ditto ...	......
25	Ditto ...	Partapgurh	1 Louthawas ... 2 Chandpur ...	896	Ditto ...	......
26	Ditto ...	Lalpura	1 Bijpuri ... ... 2 Chahakabas .	$571\frac{1}{2}$	Ditto ...	......
27	Ditto	Bhangurh	1 Choukhoonta ... (Jeypur).			
			2 Dughati	6,050	Ditto ...	......
28	Ditto ...	Naraini	1 Baldeogurh ... 2 Barwa Dungri ...	4,070	Ditto ...	......
29	Ditto ...	Thana Ghazi	1 Tori Nijran ... 2 Jodhawas ...	$1,614\frac{1}{2}$	Ditto ...	......
30	Ramgurh ...	Nougaon	1 Nougaon ... 2 Mahomedpur ...	$419\frac{1}{4}$	$10\frac{19}{20}$	$408\frac{3}{10}$
31	Ditto ...	Jadouli	1 Jadouli ... ... 2 Malikpur ...	$1,434\frac{1}{2}$	......	In plain.
32	Tijara ...	Majra	1 Ibrahimpur ... 2 Shahpur ...	$325\frac{9}{20}$	$3\frac{3}{20}$	$322\frac{3}{10}$
33	Ditto ...	Goul	1 Jirouli ... 2 Goul ...	$1,449\frac{17}{20}$	On the hill ...	......
34	Ditto ...	Tijara	1 Kalliaki ... 2 Allahpur ...	$1,985\frac{3}{10}$	$441\frac{3}{10}$	1,544

35	Tapukra ...	Indour	1 Gaidwar ...	2 Choharpur ...	$4,362\frac{1}{5}$	On the hill ...	......
36	Kishengurh ...	Gugalheri	1 Jhamuwas ...	2 Gugalheri ...	$26\frac{3}{4}$	......	In the plain.
37	Ditto ...	Jhamuwas	1 Fatehabad ...	2 Gugalheri ...	$789\frac{2}{5}$	......	Ditto.
38	Ditto ...	Ghasouli	1 Khanpur ...	2 Ghasouli ...	$68\frac{3}{5}$	8	$60\frac{3}{5}$
39	Rajgurh ...	Kuncha	1 Doulatpura ...	2 Kuncha ...	$913\frac{9}{10}$	......	In the plain.
40	Ditto ...	Kanowas	1 Jodhawas ...	2 Kankwari ...	$662\frac{1}{10}$	On the hill ...	......
41	Ditto ...	Rajpur	1 Thana ...	2 Nyabas ...	4,300	Ditto	......
42	Ditto ...	Tahla	1 Kiraska ...	2 Balsa ...	2,585	Ditto	......
43	Ditto ...	Doulatpura	1 Koundrouli ...	2 Kuncha ...	3,394	Ditto	......
44	Ditto ...	Kundla	1 Patappur ...	2 Dhamrer ...	$11,316\frac{3}{5}$	$9,935\frac{11}{20}$	$1,381\frac{1}{20}$
		Amridehri, &c.					
45	Ditto ...	Noudu	1 Murlipura ...	2 Jadabas ...	23,918	On the hill ...	......
46	Ditto ...	Dabkan	1 Mirouli ...	2 Kankwari ...	8,709	Ditto	......
47	Ditto ...	Bighouta and Gordhanpur ...	1 Gordhanpura ...	2 Kundla ...	$8,259\frac{3}{5}$	Ditto	......
48	Bahror ...	Bahror	1 Barod ...	2 Kaleanpur ...	$5,548\frac{9}{10}$	......	In plain.
49	Luchmangurh ...	Haripura	1 Gopalpura ...	2 Haripura ...	$5\frac{1}{5}$	......	Ditto.
50	Ditto ...	Saidka	1 Rounjahill ...	2 Saidka ...	$417\frac{1}{20}$	......	Ditto.

Statement of "roonds" or grass reserves in the Ulwar State—concld.

Number.	Pergunnah.	Name.	Villages surrounding the "roond."	Area in bigah or $\frac{2}{3}$ of an acre.	Situation of "roond."	
					On the top of hills.	In the plains.
51	Luchmangurh ...	Moujpur	1 Berla ... 2 Gouthri ...	1,422$\frac{1}{5}$	473$\frac{9}{20}$	498$\frac{3}{4}$
			Total of measured and surveyed area ...	2,01,734$\frac{14}{20}$	......	......
			Estimated total of unmeasured and unsurveyed area	1,66,026	Fairly accurate.	
			Grand Total ...	3,67,760$\frac{14}{20}$		

(Sd.) H. P. PEACOCK, *Lieutenant-Colonel,*
Political Agent, Ulwar.

No. 3672I., dated Fort William, 12th December 1883.

Endorsed by the Foreign Department.

Copy of the foregoing, together with map in original, forwarded to the Revenue and Agricultural Department, with reference to the office memorandum thence, No. 193F., dated the 14th September 1883.

Govt. C. B. Press, Simla.—No. 1 R. & A. D.—11-4-84.—600.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from T. W. HOLDERNESS, Esq., Under-Secretary to the Government of India, Revenue and Agricultural Department (Agriculture), to the Secretary to the Government of Madras, Revenue Department, dated Simla, the 26th April 1884, Circular No. 53-A :—

In continuation of the Resolution No. 16-A of the 1st March 1883, on the establishment of fuel and fodder reserves, I am directed to forward, for information, the accompanying report* on fodder reserves or "roonds" in the Ulwar State.

* From Foreign Department, No. 3672-I, dated 12th December 1883.

2. It appears that in addition to the supply of fodder furnished by the hay stacked after the rains of the previous year, food is estimated to be available in a year of drought for forty cattle per square mile on about 400 square miles of "roonds," *i.e.*, for about 16,000 cattle in all.

ORDER—dated 9th May 1884, No. 622, Revenue.

Miscellaneous.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture, for information.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

80 Copies.

Inw No 1457/84.

Gobt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 9th May 1884, No. 622.

MAY.

Fodder Reserves.

Letter from the Government of India forwarding a report on — in the Ulwar State, communicated to the Board of Revenue and Director of Revenue Settlement and Agriculture, for information.

Q. 1375

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre
Madras 5th June 1884

(By order)
Seapana Ro
1st. Assistant

To
The Dy: Director, Party No III

21st February 1884, No. 251, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—G.O., dated 19th January 1884, No. 136, Financial :—

Abstract.—*Budget Estimates.*—Passing orders on the consolidated Civil Budget estimate for the year 1884-85.

Order—dated 21st February 1884, No. 251, Revenue.

Revenue,
General.

In the above proceedings the Financial Department require that, in the estimates of revenue charges (Provincial) for 1884-85, a reduction of 2 lakhs should be made under Land-revenue and of ½ lakh under Forests.

2. After careful examination of details, the Government consider that a reduction to the extent named can be made in the undermentioned heads of Land-revenue charges :—

Land-revenue proper.

	RS.	RS.
I.—Salaries of Assistant Collectors	50,000	
II.—Do. of Deputy Collectors	20,000	
III.—Temporary establishments	35,000	
IV.—Service of revenue processes	50,000	
V.—Purchase of lands at sales for arrears of revenue and miscellaneous	20,000	
		1,75,000
VI.—*Settlement*		25,000
Total ...		2,00,000

3. For Assistant Collectors the present estimate is Rs. 1,50,000 against actuals amounting to Rs. 75,000 for 1882-83. The average actuals of the last five years are under one lakh* which amount, therefore, seems sufficient for 1884-85. The only question to be considered in this connection is that of a margin to cover the cost of Temporary Deputy Collectors who may be needed to supply a possible deficiency in the number of Assistants. If this contingency cannot be met from possible savings under this head as well as out of the provision for Deputy Collectors, a supplementary grant can be asked for in the course of the year.

* G.O., dated 15th November 1883, No. 1410, paragraph 3.

4. The reduction made in the provision for Deputy Collectors (Rs. 20,000) is the amount allowed in the present estimate for the five appointments on the new scale not yet filled up. If it is decided during the year to fill up these appointments, a special allotment will be obtained.

5. For temporary establishments the present provision is Rs. 61,400 against an actual expenditure of Rs. 23,600 in 1882-83, and includes an item of Rs. 23,000 against Rs. 9,000 in the current year's budget for arranging records. This and other items provided for in excess of past actuals must be retrenched to the extent of the reduction (Rs. 35,000) now made under this head.

6. For the service of revenue processes the original estimate (Rs. 1,00,000) was subsequently raised at the Board's request by half a lakh.* Looking, however, to the present largely reduced amount of outstanding † arrears and the further sums which will probably be written off, the Government consider that the original estimate, which is still more than double the average actuals of the five years preceding the famine, ‡ should suffice.

* Financial G.O., dated 4th December 1883, No. 2762, paragraph 3.

		RS.
† On 1st January 1882	... ...	58,32,000
,, ,, ,, 1883	... ...	46,14,000
,, ,, ,, 1884	... ...	22,01,000
‡ 1871-72	... ...	22,000
1872-73	... ...	43,000
1873-74	... ...	40,000
1874-75	... ...	37,000
1875-76	... ...	91,000
	Average ...	46,000

7. The settlement budget for 1884-85 amounts to Rs. 3,25,000 against actuals amounting to Rs. 2,36,000 for 1882-83, and the following seem to be appropriate items therein for retrenchment to the extent of Rs. 25,000:—

No. VI or Nílgiri Settlement Party.—The estimate provides for its retention for the whole year, while Mr. Benson considers § a provision for half the year sufficient, and the recent application ‖ for the Secretary of State's sanction for his continued employment on the settlement duty is limited to 30th September 1884. Moreover, it has been recently decided ¶ that one-third of Mr. Benson's pay and allowances shall be debited to Forests. This item, therefore, may be safely reduced by half, *i.e.*, from Rs. 24,000 to 12,000. The excess provision for three other items may be reduced thus—

§ Director's letter — paragraph 8, in G.O., dated 6th October 1883, No. 1241.

‖ G.O., dated 19th January 1884, No. 87, Revenue Department.

¶ G.O., dated 21st January 1884, No. 106.

	Excess.	Reduction.	
	RS.	RS.	
Central office establishment	6,066	4,000	G.O., dated 6th October 1883, No. 1241, paras. 4, 5 and 8.
Printing	4,000	2,000	
Extra establishments ...	11,900	7,000	
Total ...	21,966	13,000	

8. In the Forest Budget a reduction of half a lakh of rupees will be made in the provision of Rs. 83,630 ** as a reserve under the head of "Conservancy and Works" for the Southern Circle. This lump provision is intended to some extent at least to meet unforeseen requirements in the course of the year, and if the reduced reserve (Rs. 83,630 — 50,000 = 33,630) is found insufficient, it can be supplemented by probable savings under the head of Establishments for which, it is observed, provision has been made up to the sanctioned maximum. There is further an opening in the probable improvement in the general financial position such as would admit of a supplementary

** G.O., Revenue Department, dated 29th November 1883, No. 1483, page 61.

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allotment to replace the present retrenchment—*vide* concluding part of paragraph 4 of the proceedings read above.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

— No 988 A

Communicated to the officers in charge of Settlement parties for information and guidance.

2 The sum of Rs 7000 by which the provision for Extra Establishment has been reduced has been deducted from the grants of the undermentioned parties: care must be taken that expenditure does not on any account exceed the Budget as now modified.

Party No I Rs 1500
Do — No II Rs 1500
× Do — No III Rs 2000
Do — No V Rs 2000
Rs 7000

[illegible]
Director of Reve: Settt
& Agriculture

Deptt of Reve: Settt & Agriculture
Madras [illegible] March 1884

To the Financial Department.
,, the Accountant-General.
,, the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

This must not be exceeded

80 Copies.

[illegible] Dy Director Party No III

In No. 753/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 21st February 1884, No. 251.

FEBRUARY.

Budget Estimates of Revenue Charges for 1884-85.

Making a reduction of two and a half lakhs in —.

12TH MARCH 1884, No. 348, REVENUE.

197

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—Memorial from ROBERT STANES, Esq., and others, to His Excellency the Right Honorable the Governor in Council, Fort St. George, dated Coonoor, 14th December 1883.

ABSTRACT.—Submitting a memorial on behalf of the Planting Associations, Nílgiris, asking for certain concessions.

ORDER—dated 12th March 1884, No. 348, Revenue.

Land Revenue, No. 45.

In the foregoing memorial from certain gentlemen connected with the planting interest on the Nílgiris, the following requests are put forward :—

(1) that in view of the depressed state of the planting industry, planters may be allowed to pay one year's arrears with each year's assessment;
(2) that in cases where the whole of the arrears are or have already been paid up at once, one year's arrears be remitted;
(3) that planters be not called upon as at present under Mr. Puckle's rules, to pay an average auction-price of Rs. 25 an acre as purchase money, and Rs. 2 an acre as assessment on excess areas found by survey in putta lands above a certain percentage;
(4) that the present system under which waste lands are sold by auction be abandoned in favor of a system of grants;
(5) that the freedom from assessment hitherto allowed for five years in the case of forest and grass lands under tea and of forest lands only under coffee and cinchona be now extended to
 (a) grass lands under coffee and cinchona;
 (b) lands bought from native puttadars.

2. The memorialists will be informed that of the concessions sought for under the last-mentioned head, the first has already been granted in the Order noted in the margin while by G.O's., No. 1349, dated 30th October 1883, and No. 331, dated 8th March 1884, lands planted with cinchona, whether held under private proprietors or under Government on putta, have been exempted for five years (1883—1887 inclusive) if brought under cultivation during that period. With regard to arrears, the Government are not prepared to sanction in any case the entire relinquishment of any portion of the revenue, but the Collector of the Nílgiris will report through the Board of Revenue whether the planting industry is so depressed as to require the concession first suggested, viz., that of an extension of time within which payment of arrears still due may be made. Turning to the third concession asked for, the Government observe that the rule to which objection is taken was very carefully considered, that it is far from oppressive and has been found to work excellently without any detriment to individual interests, and that it will cease to operate when the current settlement is complete. No change can be made, therefore, in this respect.

G.O., 19th October 1883, No. 1307.

8. There remains only the suggested substitution of the grant system under which assessment would be leviable immediately on entry for the system of sale of waste lands, under which the land is held free of assessment for five years from the date of purchase. The consideration of this question was recently deferred by G.O., 28th September 1883, No. 1205, but the Board of Revenue will now instruct the Collector to ascertain and report whether such a change would be acceptable to the planting community generally.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue, with a printed copy of memorial.
,, the Director of Revenue Settlement and Agriculture.
,, Robert Stanes, Esq., &c., Fernwood, Coonoor.

Exd. W. H. French.

70 Copies.

198

Rev No. 886/84

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. *Encl.*

No. 818

G.O., 12th March 1884, No. 348.

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 31 March 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Rev.
Settt. Party No. III

MARCH.

Memorial

from Mr. Robert Stanes, Major-General Morgan, and other gentlemen, praying for certain concessions in consequence of the depressed state of the planting industry on the Nilgiris.—Orders passed on —.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 9th February 1884, Mis. No. 1198 :—

Read—the following letter from H. W. BLISS, Esq., Commissioner of Salt Revenue, on special duty, to the Secretary to the Board of Revenue, dated Madras, February 4, 1884, No. 4 :—

Referring to the Board's Proceedings, No. 139, dated January 16, 1884, I have the honor to forward return of lands, &c., held by me, in the prescribed form received on the 31st ultimo.

2. In doing so, I beg respectfully to state that I can find nothing in the rules laid down by the Government of India and the Secretary of State, with respect to the holding of lands and of shares in Public Companies by Covenanted Civilians, to lead Government to inquire even as to the fact (much less as to the amount) of an officer's investments in Companies not holding land for agricultural, mining or trading purposes. I respectfully venture to think, for instance, that Government are not justified, in the absence of any suspicion or rumour that an officer is addicted to speculation to such an extent as to interfere with the discharge of his public duties, in requiring him to disclose his private affairs by stating what shares he holds in the Bank of Madras or in the South Indian Railway or even in the Bank of England. I am not fortunate enough to have large investments, nor do I object to disclose what I have. It is therefore with no personal object that I venture to draw attention to what seems to me an unnecessary and undue inquiry into the private means of officers. If these returns were for the sole information of the Members of Government it would be a different matter. But as they are, they constitute in my humble opinion an unnecessary publication of the private circumstances of gentlemen in the service, especially when, as was the case last year, the returns are printed and circulated to all the officers subordinate to the Board, in such a way that all the office establishments have access to them.

3. I trust that in making these remarks and in requesting that they may be laid before Government (I hope with the support of the Board) I shall not be considered to be wanting in respect for the orders of Government.

Resolution—dated 9th February 1884, Mis. No. 1198.

The Board resolve to submit Mr. Bliss' letter and return to Government in anticipation of their general return, for the compilation of which the information required is not yet complete, owing to the statements of some officers having been sent back for revision.

2. In the views expressed by Mr. Bliss the Board entirely concur, and venture to seek a reconsideration by Government of the orders recently promulgated. It is submitted that the requirements of Government in this matter which necessitate the exhibition by each member of the Civil Service of all investments in joint-stock Companies, go beyond the restrictions imposed by Government in regard to their officers' connection with such Companies; and that the inquiry is of a nature to cause an amount of dissatisfaction on the part of the officers affected by it, which is out of proportion to the advantage gained to Government by the information afforded.

3. For these reasons the Board commend Mr. Bliss' letter to the favorable consideration of Government, and trust that the recent orders upon this subject

may be modified in such manner as to require the submission only of such a return as may be needed to enable Government to ascertain that their orders are being observed.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Chief Secretary to Government, Public Department, with original letter and enclosure to be returned.

Copy to the Commissioner of Salt Revenue, on special duty.

Order—dated 22nd February 1884, No. 255, Revenue.

Miscellaneous.

There is much force in the objections urged by Mr. Bliss and the Board of Revenue.

2. The following form, intended to elicit information essential with reference to the despatch of the Secretary of State, No. 46, dated 31st May 1862 (printed in G.O., 1st December 1882, No. 1357), will accordingly be substituted for that issued with G.O., 25th April 1883, No. 511 :—

No.	Name of the Officer.	Official Designation and Station.	Particulars of Land held.					Registered Companies in which shares are held.			Whether the right so conferred has been availed of and, if so, to what extent.	Remarks.
			Where situated, *i.e.*, District and Taluk.	Description of the land.	Extent in Acres.	Assessment or Quit-rent payable, if any.	Purpose for which the land was acquired and how actually utilized.	Names of Companies.	Where they carry on operation.	Whether the shares convey any right to acquire landed property and, if so, to what extent.		

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue, with two enclosures.
" the Director of Revenue Settlement and Agriculture.
" the Superintendent, Revenue Survey.
" the Inam Commissioner.
" the Director, Government Cinchona Plantations, Parks and Gardens, Nílgiris.
" the Public Department.
" the Judicial Department.
" the Financial Department.
" the Public Works Department.
" the Military Department.

Exd. W. H. French.

150 Copies.
150 "

Ins No. 927/84

Gobt. of {1884} Madras.

REVENUE.

No. 1109

Issued

Recd. Encl.

G.O., 22nd February 1884, No. 255.

...mmunicated to the Officers in charge of Settlement Parties, to ... Agricultural Reporter and to the Inspector of Cattle Diseases

...pt. of Rev. Sett. & Agre. }
...adras 7th April 1884 }

(By order)

[signature]
1st. Assistant

...he Dy. Director of Revue:
Settt. Party No. III

FEBRUARY.

Return of lands, &c., held by Covenanted Civilians and Military Officers in Civil employ.

Substituting a form of — for the one issued with G.O., 25th April 1883, No. 511.

14TH MARCH 1884, NO. 376, REVENUE.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from J. MONTEATH, Esq., Acting Under Secretary to the Government of Bombay, Revenue Department, to the Secretary to the Government of India, Revenue and Agricultural Department, dated Bombay Castle, 8th January 1884, No. 176; and endorsement by C. S. BAYLEY, Esq., Officiating Under Secretary to the Government of India, Revenue and Agricultural Department, dated Calcutta, the 4th March 1884:—

With reference to the letter from this office, No. 6076, dated 16th August 1883, I am directed to forward, herewith, for the information of the Government of India, copy of a report, No. 569, dated 10th December 1883, by Dr. D. MacDonald, Secretary and Curator, Victoria and Albert Museum, Bombay, on certain specimens of locusts found in this Presidency which were sent to him for examination.

ENCLOSURE.

Letter from Dr. D. MACDONALD, M.D., Secretary and Curator, Victoria and Albert Museum, Bombay, to the Acting Under Secretary to Government, Revenue Department, dated Bombay, 10th December 1883, No. 569.

With reference to Government Resolution, No. 6075, dated the 16th August 1883, I have the honor to submit my report regarding the specimen locusts sent to me for examination.

2. Several causes have delayed this report. When the specimens were first submitted to me, they were newly hatched; and it required a microscopic examination to determine whether or not they belonged to the True Locust Family—the Acrydiidæ—and it was necessary to wait until the insects developed in order to determine the species to which they belonged. When I asked for full-grown insects in order to compare them with the young, and also in order to identify them, it was too late in the season, as the old generation had died out. I received, however, one or two old and battered insects from Thána, and these were sufficient to enable me to identify the species as that of the *Acrydium peregrinum*. I have been also delayed by my attempt to discover some simple, easily recognised, markings which would be sufficiently distinctive to enable even the unscientific to determine whether insects, suspected to be locusts, were or were not real Migratory Locusts; and, once having found such markings, I have been desirous of finding out whether they were to be found all through the life of the insect from the time it emerges from the egg up to the time when the insect becomes mature. I have only now completed these observations, and have obtained insects in all the different stages of development. I have also experienced great difficulty in finding out the particular species to which some of the insects belong. I could obtain no assistance from books. Even in the Asiatic Society's Library I failed to get any books, or monographs, on Entomology, or at least such as dealt with the subject in such detail as to treat of the various species of the family Acrydiidæ. I applied both to the Madras and Calcutta Museums and failed to get any help. The Calcutta Museum authorities replied that there was one gentleman connected with the Museum who took charge of the Invertebrate Department, but that he was in England just now; and advised that the insects should be sent to England. This seems the best thing to do; and I accordingly send herewith two insect boxes which could be sent to England. It must not be supposed that those sent include all the species of the family Acrydiidæ found in the Bombay Presidency. I have myself received several other kinds which, however, came to me in so injured or decayed a condition as to make it impossible to preserve them. I have also found one or two kinds, in other years, when looking for other insects; which have not been sent to me at all.

The only scientific work that could supply full and reliable information on locusts is the "Reports of the United States Entomological Commission" (2 large volumes), which Government should get as a work of reference.

3. The word "Locusts" has at different times and in different places been used in many senses; and one unfortunate thing about the name is the fact that there is a family called Locustidæ to which the ordinary locust does *not* belong. The true or Migratory Locust belongs to another family called the *Acrydiidæ*, which differs from the Locustidæ in having only three joints on the tarsus or "foot" instead of four; and in having the antennæ short and thick instead of long and threadlike. The term "Locust" is now generally associated with the idea of a very destructive insect. This in itself, however, is not sufficient to give definiteness to the word, for, used in that sense, it has been, in North America, applied to insects belonging to the Cicadidæ, and in England even to the Cockchafers! When, however, we associate with destructive propensities the attribute of *migration* we narrow the definition in such a way as to include only migratory species of the family Acrydiidæ. Further, we find that this term is used differently in the new world as compared with its use in the old world. In Europe by a locust is meant an insect of large size, the smaller allied species being known as "grasshoppers." But in America the insect known as "the Rocky Mountain Locust" would in Europe be looked upon as a "grasshopper" rather than as a "Locust." And yet it is this same "Rocky Mountain Locust" which attracted so much attention in America as to make the United States Government appoint a Commission of scientific men, who, in their "Reports of the United States Entomological Commission" (2 large volumes), have accumulated a mass of important and interesting information not only on the Rocky Mountain Locust, but also on the locusts found in other parts of the world.

4. The best known Migratory Locust is the *Pachytylus migratorius*. It is common nearly all over Europe and has been the cause of the numerous recorded locust "plagues" or "scourges" in Europe. Eastern Europe is especially noted for the oft-recurring devastations caused by the attacks made by the *Pachytylus migratorius*. They appear in swarms so enormous as to be scarcely credible. The south of Russia, with its vast corn-producing plains, seems to be specially liable to this scourge. Conjectures have been made as to the original home of this insect, and it is probable that it came originally from some of the barren tracts or steppes of Central Asia. This is, however, little more than conjecture. It is certain, however, that what is called "the area of permanent distribution" (by which is meant the area within which the insect is always to be found) extends "from the parallel of 40° north, of Portugal, rising to 48° in France and Switzerland, and passing, in Russia, as far north as 55°, thence continuing across the middle of Siberia, north of China, to Japan, thence south of the Fiji Islands, New Zealand and North Australia; thence again to Mauritius and all over Africa to Madeira." The distribution in the southern portion of this vast belt is, however, uncertain. Of course "the area of occasional distribution" is still more vast. Thus it is well known that England has, on several occasions, been visited by the *Pachytylus migratorius*, and also Scandinavia and Finland. The vastness of this area has not unfrequently given rise to errors in determining the species, for the tract above described traverses regions where one or two other species perfectly distinct from the *Pachytylus migratorius*, are found, either permanently, or as occasional visitors. For example, the species known as *Pachytylus cinerascens* is the most common of the locusts found in Britain. A French writer asserts that this species breeds regularly in Belgium, whereas the *Pachytylus migratorius* is an occasional visitor merely, and it has been confounded with the other species.

5. The *Acrydium peregrinum*, which has within the last year or two been swarming over a large part of Bombay Presidency, is believed to be little more than an accidental visitor to Europe It has been seen occasionally in the south of Spain, and in 1869 was found over a large part of England. The *Acrydium peregrinum* is larger than the *Pachytylus migratorius*; and its area of distribution is much less definite. But Africa and the tropical parts of Asia, especially India, are considered its permanent area of distribution. Its destructiveness is not less than that of the *Pachytylus migratorius*. The *Acrydium peregrinum* is believed to be the species found in vast swarms in the Atlantic, far from land; and it is believed to occur in the West Indies and in Central America.

6. The *Acrydium* of North America resembles the *Acrydium peregrinum* very closely, but is said not to be migratory, and therefore is not a true locust.

7. Another closely-allied species, *Acrydium parananse*, found in the Argentine Republic, is migratory.

8. *Calaptemis Italicus* is a smaller insect than those named, and has a limited area of migration. Its ravages, however, are as great as those of the better known species. It is a Mediterranean species found most frequently on the European side of that Sea, and extending occasionally into Southern Russia.

9. *Calaptemis spretus* is the "Rocky Mountain Locust" or "hateful grasshopper" of the North American Continent. Though a comparatively small insect, smaller than some grasshoppers of English fields, its destructiveness has procured for it, within the last twenty years, a notoriety equal to that of the locusts of the Eastern World. Recently its persistent migration has succeeded in extending its area of permanent distribution. It is unnecessary for me to enter into the details of its history, as it is confined entirely to the Rocky Mountains of North

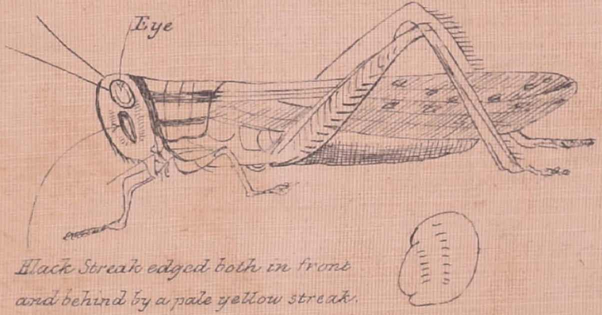
America, and the cultivated land which fringes these mountains. In its migrations, however, this insect has spread westwards nearly across the American Continent and even east into the Eastern States.

10. These constitute the most of the locusts which have come to be feared on account of their ravages. The two first named *Pachytylus migratorius*, and *Acrydium peregrinum* are found in India, but the *Pachytylus migratorius* is only an occasional visitor. It has been found rarely on Malabár Hills, in the Island of Bombay, and has probably been a traveller from across the sea. At any rate it is a comparatively rare insect in Western India. Not so the *Acrydium peregrinum*, which is indigenous to India. It is found on the slopes of the Western Ghâts—Mátherán and Mahábaleshvar, as well as less well-known hills,—every hot weather. During the last few years, however, it has both increased in numbers, and has extended its area of migration; and the danger is that it may—as the Rocky Mountain Locust has done—gradually extend its "area of permanent distribution," which would then become a base of operations for a still wider "area of occasional distribution." It is to be hoped, however, that the recent extended energetic efforts of Government may stamp out, or at least greatly curtail, the scourge. It is difficult to account for the increase in the numbers of locusts, and also for the extension of their area. It is not impossible that the years 1878 and 1879, when there was deficient rainfall, may have been an indirect cause. As the vegetation on the hill-slopes was affected by the drought, the locusts may have extended their migrations into new regions in search of food. Their eggs were deposited in these new regions, and the young generations have continued the onward march commenced by the old, until now a large portion of the Bombay Presidency has been reached by the voracious insects.

11. This conjecture receives some colouring from the fact that, contrary to the usual custom by which locusts deposit their eggs in elevated barren tracts, the new generations have sprung up in cultivated and low-lying districts. One advantage of this new departure on the part of the locusts is, that the district officers were able to detect the presence of locusts very soon after they had emerged from the eggs and when they could be very easily killed.

12. The distinctive mark by which, I think, it is easy for an intelligent person to distinguish true locusts even in the earliest stage of existence, is the dark streak which extends downwards and backwards on the side of the head, beginning at the lower border of the eye. The dark streak is bordered behind and in front by a pale yellow streak, but the dark streak is sufficiently distinctive. In the young state, too, the true locusts are generally spotted, rows of dark spots running along the limbs and body. These are not found, however, in the adult state, but may serve to confirm the opinion formed from the presence of the streak on the side of the head.

ROUGH SKETCH SHOWING DARK STREAK IN TRUE LOCUST.



Black Streak edged both in front and behind by a pale yellow streak. The posterior yellow streak passes up for some distance behind the eye.

13. Of the insects in the boxes sent herewith, those marked 1 are specimens of the true Migratory Locust—*Acrydium peregrinum*. The specimen with the coloured wings is one of last season's: the full-grown ones with the colourless wings are of the new generation. The skins are the final castings left behind when the locust emerges a full-grown insect. The spots on the limbs, &c., are still visible.

14. Those marked 2 are specimens of the insect which was found all over the Presidency early in the monsoon. I have already given a brief sketch of this insect, specimens of which were forwarded in bottles to England for identification, &c. I stated in my sketch that little damage was done by this insect. One district officer has recently affirmed that the insect is very injurious. The evidence, however, obtained from most districts, is not in favor of this view; and I still think that the damage done by this species is insignificant, and would not be noticed in ordinary seasons.

15. The insect marked 3 is a single specimen of the *Tryxalis montana*. Specimens were forwarded to me from several districts, but in none of these was this species numerous enough

to do any damage. The insect, however, is interesting, as Wood, in his "Insects abroad," avers that this insect was the cause of a moderate locust scourge in Sind, which was observed by Jerdon and another naturalist—a Civilian (C. Horne, Esq., F.L.S., late B.C.S.) who wrote an account of it in Hardwicke's Science Gossip for 1871. I am inclined to think, however, that Wood's conjectures are erroneous, judging from the information I have received regarding this insect's life and habits as observed by some of the district officers.

16. Those marked 4 are specimens of a species found in Khándesh; but it may possibly be found in other districts. In Khándesh this kind was found only in sugar-cane and swampy nálás, and was found to have done slight damage to the sugar-cane.

17. No. 5 is a single specimen obtained from Khándesh where it was found in grass fields. It is common all over the Deccan and does no damage. It is easily distinguished by its large bright yellow and black underwings which are not shown in the specimen sent herewith, as the specimen came dried in the closed-wing position.

18. No. 6 consists of two, out of four specimens sent preserved in spirits in a bottle from the ghâts above Thána, by the Commissioner, Mr. Sheppard. I took two insects out of the bottle and spread them out. These were the only specimens I obtained. I wrote for more specimens but failed to get any.

19. No. 7 is another of the Khándesh insects. It is found chiefly amongst grass, but is known occasionally to eat the leaves of Indian corn. It was found in only two tálukas.

I should like to mention here my indebtedness to Mr. Davidson, Assistant Collector, whose specimens were the only ones sent me that had been prepared in a scientific way. Mr. Davidson's detailed description of the living specimens was of much assistance.

Endorsement No. 41 (Famine).

Copy forwarded to the Government of Madras for information.

(By Order.)

(Signed) C. S. BAYLEY,
Offg. Under Secy. to the Govt. of India.

ORDER—dated 14th March 1884, No. 376, Revenue.

Miscellaneous.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
" the Director of Revenue Settlement and Agriculture.

Exd. P. L. Pereira.

80 Copies.

In No. 1056/84

Govt. of (1884) Madras.

REVENUE.

No 957.

Issued

Recd. *Encl.*

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter.

Dept. of Rev. Sett. & Agrc.
Madras 7 April 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Reve. Settt.
Party No. III.

G.O., 14th March 1884, No. 376.

MARCH.

Locusts.

Copy of Dr. MacDonald's report on certain specimens of — of the Bombay Presidency, communicated to certain authorities.

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17TH MARCH 1884, No. 386, REVENUE.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following G.O., dated 4th March 1884, No. 151, Political :—

Read—the following letter from Lieutenant-Colonel J. W. RIDGEWAY, Officiating Under-Secretary to the Government of India, Foreign Department (General), to the Chief Secretary to Government, dated Fort William, 25th February 1884, No. 705 I :—

I am directed to acknowledge the receipt of your letter, No. 725, dated 12th October 1883, requesting that the Government of Madras may be favored with definite instructions regarding the treatment of the subjects of Native States who in time of famine may wander into British territory, and further, inquiring into the measures of reciprocity that should be established between the British Government and a Native State in connection with any liability incurred by one, in respect to the subjects of the other, Government.

2. In reply, I am directed to inform you that the Government of India entirely concur with the Famine Commissioners that all applicants for relief at British works or at British relief-houses should be treated without any reference to their nationality. Any attempt to discriminate between British subjects and emigrants from native territory would not only be easily frustrated, but, if it were practicable, it would be harsh and probably lead to the disorganization of our own system of relief.

3. But while the British Government is ready to accept the responsibility of giving relief, as far as possible, to all who may seek it, the liability of each Native State to provide for the wants of its own population is not overlooked. The Governor-General in Council is not, however, prepared to lay down beforehand any definite rules as to the extent of pecuniary responsibility which may attach to any native ruler who may neglect his duty in this respect. It is impossible to discount the value of the various considerations which would have to be weighed in arriving at any estimate. Each question, as it arises, must be settled upon its own merits, and the ability of the Native State to contribute, as well as the efforts which it has made to check the emigration of its subjects by relieving their distress, will be variable factors in determining the decision which is justified by the circumstances. The Government of India entertain the hope that Native States will participate in the marked interest which has recently been taken by the British Government in the elaboration of preventive measures and of Famine Codes; and they expect that, when famine recurs, the native chiefs will assist to the utmost in their power to mitigate the sufferings of their own subjects by carrying into execution the plans which have been suggested to them.

4. In the meanwhile it appears to the Governor-General in Council that the efforts of Political officers should be directed to keeping the subject of famine relief prominently before the attention of Native States. Accordingly, in the early part of last year, reports were obtained from all local Governments and Political officers regarding the condition of irrigation in native territory, and certain Political officers under the Government of India were directed to notice in their annual administration reports any special action which the chiefs might take towards extending or repairing tanks and canals. More recently again the Famine Code has been sent to the same officers, in order that it may assist the native rulers in preparing a simple set of rules which may be applicable to the condition of their territory.

5. In continuation of these measures, it now seems desirable that all Political officers should be instructed to collect, as they find opportunity, precise information which will enable them to localise famine-tracts according to degrees of intensity. When this information is obtained, the condition of communications between these tracts and the places from which, in time of famine, supplies must be drawn, should be carefully examined. With these facts before him, each Political officer will be able to offer useful advice to the Native State on the subject of improving the necessary roads by which alone relief can be brought to the people in the event of famine. It is not necessary that any special reports on the subject should be made to Government. It is sufficient that the Political officer should ascertain accurately the circumstances and offer such advice as they justify. In his administration report he should report briefly, in a special paragraph, what advice he has given and what action has been taken upon it.

6. Should the neglect of his advice and the inability of any Native State to relieve its own subjects hereafter lead to their immigration in undue numbers into the British relief camps, it will then be possible to consider the responsibility incurred by the native ruler. But at present no definite rule on the subject can be formulated. In the meanwhile, the persistent and well-informed advice of Political officers may do much to render each native ruler familiar with his duties, and to obviate any necessity for hereafter assessing his responsibility for their neglect.

Order—dated 4th March 1884, No. 151, Political.

Recorded and communicated to the Political officers concerned, for careful attention.

(True Extract.)

(Signed) E. F. WEBSTER,
Chief Secretary.

To the Political Agent, Sandúr.
" " Banganapalle.
" " Pudukóta.
Copy to the Resident in Travancore and Cochin, for information.
" " Board of Revenue.
" " Revenue Department.
" " Public Works Department.

Enclosures.

Proceedings of the Government of Madras, dated 12th October 1883, Nos. 724, 725, Political.

Read—G.O., dated 18th August 1883, No. 1006, Revenue.

Abstract.—Directing the issue and publication of the Madras Famine Code with certain modifications.

Order—dated 12th October 1883, No. 724, Political.

Ordered that the Government of India be addressed.

(True Extract.)

(Signed) C. G. MASTER,
Chief Secretary.

Letter to the Secretary to the Government of India, Foreign Department, dated Ootacamund, 12th October 1883, No. 725, Political.

I am directed to invite attention to the 11th paragraph of the letter from the Members of the Famine Code Committee (Madras Government Proceedings, No. 1080-A, Revenue, dated

5th October 1882), and to the 189th paragraph of Part I of the report of the Famine Commissioners, and to request that this Government may be favored with definite instructions in regard to the important subjects to which they relate.

(Signed) C. G. MASTER,
Chief Secretary.

ANNEXURE.

Extract para. 11 of letter from the Members of the Famine Code Committee, dated 1st April 1882.

Para. 11. We have thought it advisable not to lay down any instructions regarding the treatment of subjects of Native States, who may wander into British territory during a famine, leaving it to be inferred that no distinction is to be made between them and British subjects. The reciprocity to be established in regard to this between Her Majesty's Government and that of Native States is, as pointed out at page 61, Part I, of the report of the Famine Commissioners, a matter for the consideration of Government in the Political Department.

Extract para. 189, Part I, of the Report of Famine Commissioners.

Para. 189. With regard to the treatment of the subjects of Native States who may apply for relief in British districts, three courses have at times been followed. The usual one has been to make no distinction as to origin, but to treat all comers alike without inquiry. In the late famine in the south, in some cases such immigrants were separated from the local poor and sent back to their own country, or the State to which they were believed to belong was requested to send an officer to identify and take back its subjects. A third course was advocated by the Government of Madras in 1877, that a list should be kept of such immigrants and the bill for their support should be sent in to the State from which they came. We consider that the first of these three courses, that of treating all applicants for relief alike, whatever their nationality, is the right one. The attempt to discriminate cannot be successful, for as soon as the people learn its object they deny their true origin; and the attempt to relegate them to a country from which they fled because they dreaded starving in it may be both futile and cruel, and will probably only lead to increased habits of wandering. The British Government might with propriety endeavour to induce the Native States to take proper measures for the relief of their own poor, as far as possible, on the general system adopted in British territories, and the records of successive famines show that Native Rulers are becoming more and more alive to this duty, and ready to perform it. It will be for the Government of India to consider what degree of responsibility, pecuniary or otherwise, may attach to any State which neglects this important duty, but beyond this no further question should arise as to whether applicants for relief are emigrants from Native to British districts, or from British to Native districts, or from one part of the British territory to another.

ORDER—dated 17th March 1884, No. 386, Revenue.

Miscellaneous.

Communicated to the Director of Revenue Settlement and Agriculture, in continuation of G.O., 18th August 1883, No. 1006.

2. The Board will communicate the order to all Collectors, for information and guidance when the need arises.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

Exd. P. L. Pereira.

70 Copies.

Ind No 928/84

Govt. of (1884) Madras.

REVENUE.

Dis: 1108.

Issued

Recd. *Encl.*

ommunicated to the Officers in charge of **Settlement Parties**, to
e Agricultural Reporter and to the Inspector of Cattle Diseases

ept. of Rev. Sett. & Agre.
adras 7th April 1884

(By order)

1st. Assistant

To
The Dy: Director of Reven.
Settt Party No III

G.O., 17th March 1884, No. 386.

MARCH.

Subjects of Native States in British territory during famine.

Proceedings, Political Department, on letter from the Government of India concerning the treatment of —, communicated to certain authorities.

22nd March 1884, No. 416, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Despatch from the Right Honorable the EARL OF KIMBERLEY, Her Majesty's Secretary of State for India, to His Excellency the Right Honorable the Governor in Council, Fort St. George, dated India Office, London, 28th February 1884 (Revenue), No. 11 :—

I have considered in Council your letter, No. 1, Revenue, of 15th January last, with accompaniments, reporting the completion of the revenue settlement of the Ganjam district by the introduction of new rates of assessment in 472 surveyed villages of the Goomsur taluka.

2. The result of the settlement has been to raise the revenue of these villages from Rs. 1,73,047 to Rs. 1,89,825, or by 10 per cent. The increase, however, is due entirely to the increase in the area of occupied land which a more accurate survey has exhibited ; the average rates of assessment per acre, which were Rs. 2-15-11 for wet land and Rs. 1-8-7 for dry land, having been lowered to Rs. 2-13-4 and Rs. 1-1-9, respectively. It is explained that, considering the general fertility of the soil, productiveness of the climate, and abundance of the means of irrigation, the new rates are very light, but that it was considered that the poor and backward condition of many of the cultivators rendered moderation in the revenue demand necessary. In these circumstances, I approve the settlement which has been effected. I need only add that I consider that your Excellency's decision that "interstitial" holdings in survey numbers should be regularly measured and assessed was entirely correct.

3. It appears that the general result of the settlement of Ganjam has been to raise the recorded area of occupied land from 280,572 acres to 336,167 acres, or by 20 per cent., and to increase the realizable assessment from Rs. 6,55,732 to Rs. 7,20,449, or by 10 per cent.

4. This increase of revenue is equivalent to an annual return of $5\frac{1}{2}$ per cent. on the total cost of survey and settlement operations, Rs. 11,49,000, which I consider a satisfactory result.

Order—dated 22nd March 1884, No. 416, Revenue.

Land Revenue, No. 53.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture, with reference to G.O., 14th December 1883, No. 1563.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. P. L. Pereira.

70 Copies.

Inwd. No. 1005/Ble

Govt. of {1884} Madras.

REVENUE.

No 1121/63

Issued

Recd. Encl.

G.O., 22nd March 1884, No. 416.

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre.
Madras 8th April 1884

(By order)
Sleeparath
1st. Assistant

To
The Dy. Director of Rev: Settt.
Party No III

MARCH.

Settlement of the Goomsur Taluk.

Secretary of State's review of the report on the —, communicated to certain authorities.

25TH MARCH 1884, No. 430, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Secretary to Government, Revenue Department (through the Accountant-General), dated 8th March 1884, No. 735-28 :—

I have the honor, in reference to paragraph 5 of G.O., No. 1241, dated 6th October 1883, *ad finem*, reviewing the Budget Estimates of this department for 1884-85, to forward a proposition statement for the revision of the establishment of the Settlement Central Office.

2. The present establishment costs Rs. 1,198-8-0; prior to the reductions of 1879, the cost was Rs. 1,704; the present proposals are for an establishment costing Rs. 1,717-8-0. The small increase of Rs. 13 is explained in the statement.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Secretary to Government, Revenue Department, dated 17th March 1884, No. 833-35 :—

I have the honor in reference to paragraph 7 of G.O., No. 251, dated 21st February last, to inform you that the sum of Rs. 4,000, reduced from the budget provision for the Central Office establishment, will be saved from the marginally-noted items, and to request that Government will be pleased to sanction the full increase applied for in this office letter No. 735-28, dated 8th current.

	RS.
Salaries and allowances of Deputy Directors	3,600
Classification Establishment	400
Total ...	4,000

ORDER—dated 25th March 1884, No. 430, Revenue.

Miscellaneous.

The establishment proposed by Mr. Wilson is approved as also the source from which the retrenchment of Rs. 4,000 ordered by G.O., 21st February 1884, No. 251, paragraph 7, should be met.

2. The papers read above will be transferred to the Financial Department for final orders with reference to the Proceedings of that department, dated 30th August last, No. 1905.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Financial Department, with original Proposition Statement.
,, the Director of Revenue Settlement and Agriculture.
,, the Accountant-General.
,, the Board of Revenue.

Exd. W. H. French.

80 Copies.

In No. 994/84

Govt. of {1884} Madras.

REVENUE.

No 1120 / 62

Issued

Recd. Encl.

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre. Madras 8th April 1884

(By order)

[signature]

Ist. Assistant

To

The Dy. Director of Revn. Settt. Party No. III.

G.O., 25th March 1884, No. 430.

MARCH.

Central Office, Settlement Department.

Proposal relating to the establishment of the — and the source from which to meet the retrenchment of Rs. 4,000 ordered by Government, approved and transferred to the Financial Department for final orders.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—Mr. Garstin's Reports on the Revision of Revenue Establishments, dated 9th June and 28th July 1883.

ORDER—dated 18th March 1884, No. 396, Revenue.

Miscellaneous.

The papers read above are the reports submitted by Mr. J. H. Garstin, Acting Second Member of the Board of Revenue, who was deputed, in February 1883, to frame proposals for the revision of Revenue Establishments in the districts. Before dealing with the various suggestions made, the Right Honorable the Governor in Council desires to record his appreciation of the admirable manner in which Mr. Garstin has performed the duty entrusted to him, and of the value of the many judicious proposals contained in his reports.

2. Besides the strengthening and revision of establishments, Mr. Garstin has directed his attention to the simplification and reduction of work in the various offices, and has submitted a variety of suggestions for the general improvement of the administration. His Excellency in Council will first pass orders on the establishment proposals, and will then consider, necessarily somewhat summarily, the other suggestions which have been made.

3. *Revenue Inspectors.*—In his proposals under this head, Mr. Garstin has proceeded on the principle that 5,000 holdings and 100 square miles, or 3,000 holdings and 200 square miles, are as much as a revenue inspector can manage. He would raise the number of inspectors from 518 to 662, and the cost from Rs. 12,830 to Rs. 24,675 per mensem. The rates of pay are Rs. 40 and Rs. 35, except on the Nílgiris and in the Wynaad, where Rs. 50 and Rs. 40 are allowed. In the Board's scheme of 1875, there were three rates—Rs. 30 (305 men), Rs. 35 (206), and Rs. 45 (99), or a total of 610 inspectors. Mr. Garstin's proposals and those of the Board of 1875 are contrasted in the margin. The numbers of inspectors now proposed for the Godávari and perhaps for Tanjore appear too small, and that for South Arcot excessive. The number of holdings in the latter district is undoubtedly very great, and Mr. Garstin's opinion has, from his personal knowledge of the district, much weight. Subject to further consideration and report by the Board in regard to these districts, Mr. Garstin's proposals are approved. He has laid much stress on the work entailed on revenue inspectors by sales for arrears of rent in zemindaries. The Board are requested to obtain a return of the number of such sales and appraisements conducted by these officers, and of the amount of sale commission realised for Government under the Act.

—	Mr. Garstin.			Board in 1875, Number.
	First Class.	Second Class.	Total Number.	
Ganjam	6	6	12	14
Vizagapatam	3	4	7	5
Godávari	15	22	37	44
Kistna	17	27	44	44
Nellore	13	20	33	35
Kurnool	14	16	30	32
Bellary	13	18	31	47 (Bellary and Anantapur)
Anantapur	10	15	25	
Cuddapah	18	25	43	35
North Arcot	17	22	39	35
Chingleput	13	18	31	32
South Arcot	25	30	55	44
Coimbatore	17	24	41	35
Salem	16	21	37	32
Trichinopoly	13	13	26	22
Tanjore	18	26	44	44
Madura	15	15	30	21
Tinnevelly	16	22	38	35
Malabar	15	19	34	32
South Canara	9	10	19	17
Nílgiris	3	3	6	2
Total	286	376	662	607
Madras	..	..	..	3
				610

4. *Taluk Establishments.*—The most important of Mr. Garstin's suggestions under this head are that taluk sheristadars shall be abolished, head accountants and treasurers on Rs. 50 being substituted, who shall have no magisterial powers, and shall be charged solely with the supervison of accounts and the treasury; and that deputy tahsildars and sub-magistrates shall be appointed to give tahsildars relief in their magisterial work, and to be stationed at taluk head-quarters. These officers are also to be available for revenue work, and it is proposed that the tahsildar shall have power to transfer cases from his own file to that of the head-quarter deputy tahsildar. These suggestions appear to His Excellency the Governor in Council to be of great value. The power of transfer of cases from his own file, which it is proposed to confer on the tahsildar, would have to be conferred by legislation, and would need to be completed by power of taking cases to his own file. Such transfers, however, if frequent, would be prejudicial to the administration of justice; but, even without the proposed power of transfer, the arrangement would give tahsildars considerable relief and freedom. Prolonged absence of either of these officers from head-quarters could be provided for by use of the power of transfer which subdivisional magistrates now possess; while short absences could be arranged for in the posting of cases. It, therefore, seems inexpedient to apply for the proposed amendment of the Code of Criminal Procedure.

5. The Government, while approving the principle of Mr. Garstin's proposal, think that the opportunity of revision should be taken to raise the salaries of the deputy tahsildars and sub-magistrates, who now, for the most part, exercise second-class powers, and who are underpaid, considering the importance of their functions. His Excellency in Council would, therefore, restrict the additional appointments to taluks in which the tahsildars' magisterial work is heaviest, utilising the savings to increase the pay of deputy tahsildars as a class. The heaviest taluks may be taken to be those in which there is now no deputy tahsildar, and taluks of the two higher classes. The deputy tahsildars are now graded as marginally * noted, those on Rs. 100 being in charge either of zemindari divisions, or of large towns, (practically independent charges), and those on Rs. 70 being in charge of smaller towns and subdivisions of taluks. All on Rs. 100 should be raised to Rs. 120, and those on Rs. 70 to Rs. 80. There are now twelve taluks in the first class and twenty-four in the second; and taluks without deputy tahsildars are, second class, 2; third class, 5; fourth class, 23; fifth class, 23.† A list of these is given in the margin.‡ Eighty-nine additional deputy tahsildars will thus be required, and in sixty-five taluks the existing organisation will continue. The additional cost will then be—

			Per Mensem.
58	Deputy Tahsildars,	at Rs. 20 ..	1,160
114 §	,, ,,	at ,, 10 ..	1,140
89	,, ,,	at ,, 80 ..	7,120
		Total ..	9,420

while the saving of Rs. 10 per mensem on sixty-five taluk sheristadars, on which

*On Rs. 150	3	In Hill tracts.
,, ,, 125	1	In Hill tracts.
,, ,, 100	58	
,, ,, 70	113	
Total in Mr. Garstin's statement	175	
Masulipatam town sanctioned in G.O., 9th October 1883, Mis. No. 2672, F. D., on Rs. 70	1	
	176	

‡SECOND CLASS.—Arcot, Ambásamudram.

THIRD CLASS.—Narsaraopet, Sankaranainárkoil, Wandiwash, Atúr, Jammalamadugu.

FOURTH CLASS.—Bhímavaram, Sattenapalle, Kandukúr, Kávali, Atmakúr, Anantapur, Ráyachóti, Kadiri, Madanapalle, Pulivendla, Proddutur, Ráyadrug, Kúdligi, Alúr, Chingleput, Chittoor, Gudiyátam, Kallakurchi, Perambalúr, Melúr, Tenkási, Udamalpetta, Pollâchi.

FIFTH CLASS.—Bezváda, Vinukonda, Kanigiri, Udayagiri, Badvél, Sidhout, Rápúr, Hadagalli, Harpanhalli, Penukonda, Madakasira, Sirvel, Cumbum, Márkápur, Ponnéri, Pólúr, Shiyáli, Bhaváni, Kollegál, Krishnagiri, Cundapur, Golgonda, and Sarvasiddhi.

† Bhadráchalam and Cochin omitted.

§ Including Masulipatam town.

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Mr. Garstin counts, or Rs. 650, will not accrue. The whole cost will, therefore, be Rs. 10,070 against Rs. 10,150, the cost of Mr. Garstin's proposal. But he does not provide additional sub-magistrates in eight taluks, viz., Guntúr, Nellore, Tanjore, Tenkarai, Salem, Cuddapah, Coimbatore, and Conjeeveram, for the first six of which provision is made (as Government think ought to be done) in the scheme above sketched. The saving which he estimates at Rs. 54 each, owing to the abolition of the establishments of the existing sub-magistrates in these six taluks, or Rs. 324, will therefore not be realised. The total excess cost will thus be Rs. 144 as compared with his proposals. His suggestions as regards Coimbatore and Conjeeveram are accepted. For the Bhímavaram taluk, one of the fourth-class taluks above named, the additional deputy tahsildar should be located at Undi; and the taluk sheristadar should be retained in that taluk. In Bandar also existing arrangements will continue.

6. As regards tahsildars themselves, Mr. Garstin proposes that seven of them shall be raised one grade, and that all shall be allowed travelling allowance at a rupee a day. The first-mentioned matter will be dealt with in connexion with proposals which are now before the Government of India. As to the second, the cost would be very high, at least Rs. 35,000 a year; and there are other improvements to which, in the opinion of Government, this may be postponed.

7. Mr. Garstin's proposals as to the clerical and minor establishments in tahsildar's and deputy tahsildar's offices are approved. They are, briefly, the appointment of record-keepers (a valuable reform), an increase in the number of gumastas by 247, on salaries ranging from Rs. 15 to Rs. 30, appointment of muchies, additional shroffs, and also peons for the new revenue inspectors. The cost of gumastas or clerks is greater, though the number is slightly less than in the Board's scheme prepared in 1876; but the Government are fully satisfied that the present proposals do not go too far. With reference to paragraph 24 the Government agree with Mr. Garstin that the sub-jail warders should be provided in the Jail Department budget, and not charged to land-revenue.. It is not clear, however, whether the number of taluk peons is to be reduced in consequence, but apparently not; nor does it appear that the case of sub-jails under the charge of deputy tahsildars has been considered. Mr. Garstin is requested to report further on this point.

8. The case of taluk shroffs appears to His Excellency in Council to require consideration. These servants have hitherto not been entitled to pension, though they are more or less in the position of cash-keepers. The recent orders as to security press hardly upon them, in many cases forcing them to borrow money, the interest on which swallows up a great part of their pay. Rules enforcing their responsibility for defective coins have also of late become very stringent. The Government consider that the salaries of taluk shroffs (including those in deputy tahsildar's offices) should be raised, those on Rs. 15 receiving in future Rs. 18, and those on Rs. 10 being paid Rs. $12\frac{1}{2}$ per mensem. The cost will be for the increased number proposed by Mr. Garstin Rs. 719* per mensem, or Rs. 8,628 per annum.

	RS.
* 158 × 3 =	474
98 × $2\frac{1}{2}$ =	245
	719

9. *Divisional Offices.*—Mr. Garstin's proposals as regards divisional offices also commend themselves to Government. He proposes to replace the subdivision sheristadars by head clerks on Rs. 85, and, generally speaking, to reduce the establishments of Sub-Collectors by two clerks and two peons. A clerk is added to the Head Assistant's establishment, and the scale of pay of his clerks (except the head clerk) and those of the Deputy Collector is improved. The net result in a normal district with Sub-Collector, Head Assistant and General Deputy Collectors' offices is an increase of one hand in number and of Rs. 42 in monthly cost. The modifications in a few exceptional cases may pass.

10. *Collectors' Offices.*—In regard to Collectors' offices, the most important change proposed is to substitute Huzur Deputy Collectors for sheristadars, and to

place the Collector's office under a head clerk on increased pay. The advantage claimed is that the Collectors would be relieved of all executive charge, and that a Magistrate of the first class would always be at head-quarters. The Government, after full consideration, are unable to accept this suggestion. The new Deputy Collectors would have to be graded in the same proportion as the present sanctioned staff, and the cost would be much greater than Mr. Garstin estimates. The Government have under consideration a different plan for relieving Collectors of divisional charge; and they think that the proposed Deputy Collectors, while of little use in the Collectors' offices, would want the freedom and independence which divisional officers should have. They would be more moveable, but would possess less special district experience than the present sheristadars. It is very doubtful whether the Collector's office could be managed and his large correspondence, both English and Vernacular, effectively supervised by a single officer on Rs. 200. The Government however recognise the desirability of making some change in the present position of Huzur Sheristadars. These officers have now no inducement to serve in the taluks, and but little to seek employment as Deputy Collectors; and the result is that they remain too long in their posts. The Government resolve, therefore, to retain the English head clerks on their present pay, but to direct that the future pay of Huzur Sheristadars shall be equivalent to the pay of the tahsildar second highest in grade in the district, provided that a Collector's sheristadar shall not draw less than Rs. 200. Thus in 8 districts (Godávari, Kistna, North Arcot, South Arcot, Tanjore, Trichinopoly, Tinnevelly, and Salem) the pay will be Rs. 225, and in the remaining 14 districts (Madras and Nílgiris being included) Rs. 200 per mensem.

11. The Government do not object to the suggested abolition, so far as classification of clerks goes, of the distinction between the English and Vernacular departments of the Collector's office; and they fully approve Mr. Garstin's proposal that the district offices be relieved of the work of translating vernacular papers in criminal records sent up to the High Court. The Honorable the Judges will be addressed on the subject in the Judicial Department. If this be done, and arrangements are made to relieve Collectors of divisional charge altogether, either the vernacular head clerk or the translator could be dispensed with. But the office could not stand the loss of both; and, for the present, at any rate the translators should be retained. In most Collector's offices they now do a good deal of general work.

12. The proposals made regarding the Account Department (including the abolition of the distinction between English and Vernacular accountants and the special increase to the pay of the cash-keeper in Malabar) and the appointment of two additional pressmen in Kurnool and Kistna are approved. One pressman for Kurnool, it is observed, has already been sanctioned (G.O., 13th April 1883, No. 724, F.D.). The Presidents, Local Fund Boards, in the districts named in paragraph 61, should address the Financial Department, through the Board, regarding the Local Fund accountants said to be wanted. His Excellency in Council does not see sufficient reason to grant the special allowances proposed for revenue employés in the towns of Cuddapah and Kurnool.

13. The Collector of Tanjore will report, through the Board, on the arrangements regarding mokhasa and chuttram management referred to in paragraph 22 of Mr. Garstin's first report. The description there given is not, the Government believe, quite accurate.

14. The slight changes which Mr. Garstin proposes in the establishments of the Collectorate of Madras, except those in the Abkári Department, are approved. As regards the Abkári Department, the matter may be deferred, as it is probable that changes in the administration will shortly be made.

15. The Government have carefully considered what the Collector and Mr. Garstin have written with reference to the establishments on the Nílgiris, and are of opinion that Mr. Garstin's proposals are not sufficiently liberal, and that Mr. Brandt's recommendations are to be preferred. The latter are approved in full. The increase of cost above the present scale is Rs. 4,488 per annum, while that recommended by Mr. Garstin costs Rs. 3,624.

16. The Sea Customs establishment in South Canara temporarily sanctioned (in G.O., dated 26th July 1883, No. 913) will be made permanent as recommended by Mr. Garstin.

17. The Board of Revenue will be requested to prepare and submit, for transmission to the Financial Department for definite sanction, a proposition statement, in the usual form, showing the changes above approved of. The total increase of cost, according to Mr. Garstin's statements, is Rs. 4,73,760 per annum. But from this have to be deducted the following items :—

	RS.
(1) Regrading of certain tahsildars	2,100
(2) Deputy Collectors, with establishments on the existing scale, in Ganjam, Vizagapatam, Malabar, and South Canara, already entertained	18,240
(3) Additional clerks for Huzur Deputy Collectors	4,800
(4) Reduction in pay of Huzur sheristadars	9,600
(5) Increase of pay of Collectors' head clerks rejected	12,000
(6) Increase to Abkári establishment in Madras	2,004
	48,744

and to be added the following items :—

(1) Increase consequent on modification of proposals regarding deputy tahsildars and taluk sheristadars (para. 5 *supra*) ..	15,108
(2) Increase to pay of taluk shroffs (para. 8)	8,628
(3) Excess of Collector's scale for the Nilgiris	864
	24,600

leaving a net reduction of Rs. 24,144, and a net increase of cost of Rs. 4,49,616. But it must be remembered that the salaries of existing incumbents cannot be reduced at once, and that the savings in the pay of taluk and subdivision sheristadars, on which Mr. Garstin reckons, will not accrue till vacancies occur. These savings, allowing for the modifications above made, will come to Rs. 22,380. On the other hand, the Government desire that the increased pay to revenue inspectors be not accorded to such of the present staff, as the Collectors think not worth the higher rates. Many of the present revenue inspectors are old and nearly worn out men, who will not do better work because they get higher pay, and are on the point of retiring. The only effect of giving these men the new rates of pay would be to increase pensionary charges in the near future. Collectors will, therefore, be instructed to exercise a careful discretion in introducing the new scale; and all appointments of additional revenue inspectors should be at first in the lowest grade.

18. Under these arrangements, the charge actually incurred on the introduction of Mr. Garstin's scheme is not likely to exceed Rs. 4,50,000, the ultimate net cost. This sum is, in the opinion of the Right Honorable the Governor in Council, a very moderate increase. The sanction of the Government of India to the scheme, as revised by Government, will be applied for in the Financial Department. Until this sanction is received and communicated, no action will be taken on the approved arrangements.

19. The Government now proceed to deal with Mr. Garstin's suggestions for the improvement of the revenue administration generally.

20. *Village Establishments.*—Hitherto the introduction of the Village Cess Act has followed the revision of the land assessments, except in one case, South Canara; and Mr. Garstin proposes to introduce the Act and revise the establishments in all districts on the basis of the present revenue. The objections are, that the rate of cess would probably have to be changed when the land assessments are revised, and that the cess would add to the inequality of the burden of present rates. The Government, however, are disposed to accept the proposal, and request the Board to report upon it. They do not approve the suggestion that hereditary right to village offices should be abolished, believing that the measure would give a great

shock to native ideas, and is unnecessary. The regulation now enables Collectors to exclude incapables and to insist on any educational or other qualifications for office which are deemed indispensable. It will suffice to instruct Collectors to exclude women and illiterate persons, and to insist rigidly on residence of officers in the villages to which they are appointed. As to clubbing, the Government consider that this might with advantage be carried further than has been done in recent revisions; but they are not prepared to lay down a fixed scale as Mr. Garstin suggests, and they are opposed to the suggestion to separate the duties of collection from that of the head of the village. They also dissent from his view that the Public Accountants Act applies to village servants, who, though they render services to the State, are not officers in the service of the East-India Company (or Government). It cannot, at any rate, apply to karanams who are not entrusted with money. Nor do Government believe that any advantage would result from applying the Act. The trouble of taking and verifying security would be very great, and the powers of getting at defaulters' property, which the Act confers, are not a whit more summary or efficacious than those of Regulation IX of 1822. If village accounts are systematically and thoroughly scrutinised, and punctual collection enforced, nothing will be heard of embezzlements.

21. *Revenue Inspectors.*—A knowledge of surveying and plotting, and of calculating areas and measurements off maps would be very useful to revenue inspectors, and it is also desirable that these men should pass the Revenue Test, Lower Grade. The Government doubt, however, whether sufficient men could be got for the appointments with these qualifications if they were at once made essential by rule. It might be possible to introduce such a rule as to new appointments after sufficient notice, say three or four years; and an addition would have to be made to the test, to include surveying, &c. The Board of Revenue are requested to consider the question and report their opinion. A modified Revenue Test for revenue inspectors might perhaps be organised.

22. The suggestion that deputy tahsildars and tahsildars shall be compelled to serve before appointment for twelve months as revenue inspectors does not commend itself to Government. His Excellency in Council would, of course, place no obstacle in the way of revenue inspectors, who have done good service in that grade, being appointed to tahsils, and has recently declared service as revenue inspector to be qualifying* for the higher posts. But he is not prepared to make such service a compulsory qualification. He is of opinion that it would narrow the field of selection for tahsildarships too much, practically shutting out inspectors of police, sheristadars and head clerks who possess training equally valuable and frequently make good tahsildars; that it would operate to make service in the revenue line even more distasteful than it now is to educated young men; that as much preliminary training in practical revenue work as is indispensable to tahsildars can be obtained in the grade of deputy tahsildar, through which most tahsildars pass; and that the tahsildar's and deputy tahsildar's posts should be considered as the upper subordinate service and the training ground for Deputy Collectorships, rather than as prizes for the lower subordinate service or clerks' grades.

* G.O., No. 85, dated 18th January 1884.

23. The Government would here observe that the arrangements for the distribution of work between deputy tahsildars and revenue inspectors require revision in some districts. The ranges of revenue inspectors are sometimes settled so as not to include the deputy tahsildar's division of the taluk, and the latter officers are expected to perform the duties of revenue inspector in the villages under their charge. The result is that it is very inefficiently performed, as the deputy tahsildars' time is taken up with magisterial and other work. These officers are also an agency more expensive than it is necessary to employ in revenue inspection. The arrangement referred to should be put an end to in all districts where it obtains, and the increase to be now made in the number of revenue inspectors will no doubt enable Collectors to do this without difficulty.

24. The Board should prescribe a form of diary for revenue inspectors. Mr. Garstin's form seems suitable, except column 17. Verification of ryots' receipts is not required as every day duty.

25. The suggestion that the search and copying fees now levied by means of stamps shall be credited to provincial funds is approved. The Board will report, after communication, if necessary, with the Accountant-General and the Superintendent of Stamps, whether there will be any difficulty in carrying it out.

26. Mr. Garstin's proposals for the abolition of the fasli year and for the revision of the kistbandi or arrangement of instalments of land-revenue are, as he himself admits, intimately connected. Taking the latter first, the Government observe that the question has recently been discussed from the point of view of the ryots' convenience, and it was decided that no change is called for. The Government are unhesitatingly of opinion that Mr. Garstin's proposed two kists, one immediately after each harvest, would be found very oppressive to the ryots, who would be compelled to sell the whole produce at once in a cheap market to meet the Government demand; and they also doubt whether the proposed maximum of four kists everywhere would prove a boon. The extent to which accounting would be saved by the reduction in the number of kists appears to Government to be over-estimated by Mr. Garstin. However, it may be possible to effect some reduction in the number of kists and to arrive at a better distribution of the burden of the demand; and the Board are authorised to take up the question again in communication with Collectors.

27. With regard to the abolition of the fasli year, the Government think the advantages expected to accrue from the measure are over-rated. It is said that double accounts and reports would be got rid of, allusion being, of course, made to the finance and revenue accounts on the one hand, and to the administration and the land-revenue or jamabandi reports on the other. The finance and revenue accounts must always be distinct, as the latter embrace the settlement of the demand with which the former have no concern. The finance accounts operate as a check on the revenue accounts relating to demand, collection, and balance; but they can be used for this purpose with a demand made up for the fasli as readily as if it were made up for the official year. As regards reports, there must always be a land-revenue report similar to the jamabandi report; and even if the jamabandi settlement could be completed within the official year, the accounts and statements could never be got ready in time for the administration reports, which must therefore always be as they are now incomplete, in respect of occupation and revenue demand. The fasli is not merely an agricultural or crop year, and it may be admitted that the official year more nearly coincides with the cultivation. The fasli is a year which admits, not only of the cultivation being completed, but also of the crops harvested being realised in money, and all fiscal demands dependent on such realisation being met within it. It is intended to embrace not all cultivation and harvest, but all harvest and all proceedings for obtaining the Government share, and is an agricultural and revenue year and not the former only. With a main harvest in February or March the realisation of the demand within the official year is impossible, and Mr. Garstin himself is driven to propose that the kists for the revenue from cultivation completed within the official year shall be placed in the following year. The demand falling due in the official year must thus refer to cultivation of two different years; and though the figures could be easily manipulated in the gross, the Government apprehend that considerable confusion would be induced in the village accounts if attempt were made to carry the correction into them. The jamabandi could not be finished, if properly done, in some districts within the official year. If the demand were closed before the harvest, remission for withered crops might fall due afterwards, and claims for such remission would have to be dealt with in the following year. Meanwhile, the ryots would have to pay the settled demand. The fasli figures of cultivation and revenue may be taken with perfect accuracy for irrigation and cotton reports, as the cultivation from April to June is, under present orders, brought to account in the following fasli. The Court of Wards could not, in the cases of estates temporarily in their charge, alter the

period recognised as that of agricultural tenancy. On the whole, the Government do not think that any serious inconvenience is caused by the retention of the fasli year, and they foresee difficulties in the event of change. They, therefore, adhere to the decision arrived at in 1882.

28. Mr. Garstin reports that many district officers advocate the abolition of jamabandi, and though he only says that the present system requires modification, he evidently inclines to the same view. The Government entirely dissent. As done by many officers, jamabandi is, no doubt, mere waste of time; but the remedy is not to abolish it, but to issue such instructions as shall secure its being done as it ought to be. The tahsildars and revenue inspectors in their tours can no doubt do much to see that the accounts are written up and that the karanams are efficient in a general way; but nothing can replace the thorough, deliberate, and intelligent examination of the village accounts, in themselves and in comparison with the taluk revenue accounts, which ought to be carried out at jamabandi. Nothing does so much as this to teach the karanams their work and to keep them to it. Further, the jamabandi affords the only possible opportunity for the Collector or divisional officer to see whether the taluk authorities are doing what is expected of them. The settlement of the demand by a superior officer is intended to furnish a check upon the taluk and village officers; but, as jamabandi is now done in many cases, the superior officer merely distributes the puttas at the rate of 50 or 60 villages a day after the taluk and village officers have made the settlement between them. The Government have no doubt that much of the difficulty felt in some districts in clearing up balances arises from confusion in the taluk and village accounts, the result of long neglect. The Board should draw up succinct instructions for the guidance of officers carrying out jamabandi. These should provide for scrutiny of the cultivation accounts, to see that they are properly kept and without patent errors, and have been regularly despatched to the taluk; check of them with No. 4; check of Nos. 4 and 5 together and with the darkhast and relinquishment registers; examination of darkhast registers to see that the applications are disposed of according to rule and without unnecessary delay; check of assessment rates charged with assessment registers; scrutiny of poramboke cultivation, second crop and water-rate charges; check of No. 10 with Nos. 11, 3, and 12; check of remission claims with azmaish (inspection) reports and with cultivation accounts; check of putta totals and of postings in No. 13; examination of cases of succession to deceased land-holders, and transfers of putta; check of the remittances with taluk accounts, Nos. 5 and 6 C; scrutiny of balances in No. 7 C; and comparison and reconciliation of the balances with Nos. 5 and 6, with the village accounts of the previous year, and with No. 11, &c. Besides land-revenue, the demand of all revenue collected in the taluk which has a settled demand, should be made up at the same time. If the practice of bringing karanams to the taluk office to write up their accounts is put a stop to, and they are trained to write them in their villages leaving blank entries which require the orders of the settling officer, no karanam need be detained for more than four or five days. Great hardship on these servants and great opportunity for malpractices would thus be done away with.

29. Mr. Garstin next proposes modification of the Revenue Recovery law, and propounds a plan the characteristic features of which are the abolition of the distinction between process against moveables and against lands; initiation of process by the monegars; publication of it in the village only; appeal to the tahsildar within twenty days and sale in thirty days; constitution of the defaulter as caretaker on behalf of Government pending sale; and enactment that after process all kists due up to the date of sale may be recovered from the proceeds.

30. The scheme is very summary, but in some ways it would entail more scriptory work than the present system. The Government doubt the expediency of adopting only one kind of processes and of entrusting to monegars the power of initiating them. There would be great opportunity for oppression and wrong. His Excellency in Council is of opinion that, while the requirements of the

present Act in respect of publication are unnecessarily precise, and a law is wanted enabling the recovery without fresh process of all dues up to the date of sale, the powers conferred by the Act are quick enough and strong enough if properly worked. Difficulty in collection under the present law is due not so much to its inherent defects as to want of system and promptitude in those who have to enforce it. If quick return of process issued is insisted on, and delay in issuing subsequent processes is prevented, the Act will be found efficacious. If punctuality in collections is enforced in this way, coercive process will soon become rare in ordinary seasons.

31. The Government agree generally with Mr. Garstin in his remarks upon Act III of 1869, and the position of tahsildars under Regulation IX of 1822. But the most important, by far, of his minor suggestions is that of giving greater finality to decisions of Collectors, divisional officers and tahsildars, by restricting appeals. This matter is beset with difficulties, but is of much importance. The Board are requested to favor Government with their opinion upon it, and to endeavour to devise practical proposals which will attain the object in view without risk of denial of justice.

32. Besides the proposals of reform, all of great importance and interest, brought forward by Mr. Garstin, there are a few others which have suggested themselves to Government, and which may be appropriately dealt with here.

33. In some districts it is the practice to make divisional officers compile and furnish all periodical reports and returns complete to the Collector's office, where the district reports and returns are made up from them. In others, the information required is got direct from the taluks and digested and compiled in the Collector's office, the divisional officers not being called on, unless opinions or reports on special points are wanted. The latter is the proper course, as the Collector's office is specially organised for such work, while the divisional offices are not. In other respects also, there is a tendency to transfer to divisional offices work which the Collector's office ought to do. The result is that divisional offices are overwhelmed with work for which they are neither intended nor suited, and are kept stationary to get through it, while their proper work is neglected. Of course arrangements should be made to keep divisional officers informed of correspondence between the Collector's office and Tahsildars, the papers either passing through the divisional office, or copies being sent for the divisional officer's information. As proposed by Mr. Garstin, the submission of separate jamabandi reports by Sub-Collectors should be discontinued.

34. The power of nominating to the higher offices, tahsildar's, deputy tahsildar's and taluk sheristadar's posts, which is now vested in the Sub-Collectors as regards their own divisions, should be taken away. It interferes grievously with the proper organisation of the superior staff of the district,—a matter in which the Collector is mainly interested, and in which he should be entirely free as well as responsible. The Collector will of course consult the Sub-Collector invariably before making his selection.

35. The system of registering volunteers, who are to have a prior claim on vacancies which may arise in the paid staff, should be absolutely prohibited, as tending to deteriorate the lower ranks of the service. The advantage of partial training being obtained before men begin to draw pay is more than counterbalanced by the fact that no men will register themselves as volunteers with a prospect of serving four or five years without pay, except such as have no chance of getting into the service on their merits. The presence of a number of unpaid men in the public offices is also objectionable, and should be entirely unnecessary in future. The system should, therefore, be put a stop to, no more volunteers being registered wherever it prevails.

36. The Government are further of opinion that an increase in the power of Collectors to punish tahsildars and deputy tahsildars is essential. At present in many cases in which fine is not a suitable punishment, these officers escape

altogether owing to Collectors being unwilling to move the Board and Government to take action; and discipline in the districts is much prejudiced in consequence. His Excellency in Council is pleased to direct that in future Collectors shall have power to order transfers involving loss of salary (but not degradation of rank), and suspension for any period not exceeding six months, of tahsildars and deputy tahsildars, subject of course to appeal in every case.

37. Lastly, the Government are of opinion that measures are called for to encourage graduates of the University to seek employment in the revenue service, and to facilitate their admission into the higher grades of it. The employment of these men has been of great benefit to the administration, both in increased efficiency and still more in increased purity. What is known as the twenty-five years' order acts, in the opinion of Government, to deter many young men from proceeding to a degree; and though the average age at which the B.A. degree is taken is considerably less than twenty-five years, many more graduates would, if exempted from the rule, qualify themselves by passing the Special Tests after taking their degrees. His Excellency the Governor in Council will, therefore, apply to the Government of India for sanction to dispense with the rule, subject to the usual conditions as to ultimate pensionary claims, in the cases of all graduates who may be nominated to the public service after twenty-five years of age. Further, he is of opinion that the superior intelligence of which young men who have passed the University standards have given proofs warrants the reduction in their favour of the period of probationary service in minor appointments prescribed as qualification for the responsible post of tahsildar. Accordingly the period of three years prescribed will be reduced to two years for men who have passed the First in Arts Examination and to one year for those who possess the B.A. degree. Such men will, of course, still be subject to the Special Tests. Also, orders will issue in the Educational Department providing that at and after the examination of 1885, no persons will be permitted to appear for the higher grade revenue test who are not F.A. men or graduates, except men now in the service in the Revenue Department, who will be permitted to enter at any examination up to and including that of the year 1889.

38. The Board of Revenue will make such amendments of their standing orders as may be rendered necessary by this order.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To J. H. Garstin, Esq., C.S.I.
To the Board of Revenue.
" Director of Revenue Settlement and Agriculture.
" Judicial Department.
" Financial "
" Accountant-General.
" Educational Department.

Exd. F. R. Bantleman.

350 Copies.

Gr No 998/84

Govt. of {1884} Madras.

REVENUE.

No 1119

Issued

Recd. Encl.

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter.

Dept. of Rev. Sett. & Agre. Madras 8th April 1884

(By order)

[signature]

1st. Assistant

To
The Dy Director of Reve: Sett.
Party No III

G.O., 18th March 1884, No. 396.

MARCH.

Revision of Revenue Establishments.

Orders passed on Mr. Garstin's reports regarding —.

Proceedings of the Madras Government Revenue Department
Read the following

13TH MARCH 1884, Nos. 520, 521, PUBLIC.

915

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper :—

Extract from the Proceedings of the Government of India in the Home department (Archæology), dated Calcutta, 29th February 1884, No. 1—24-36.

RESOLUTION.

Read—the following papers on the subject of the appointment of Mr. J. F. Fleet, of the Bombay Civil Service, as Epigraphist to the Government of India :—

Despatch from the Secretary of State, No. 146, dated 21st September 1882.
Home department notification, No. 25, dated 13th February 1883.

Observations—

In the despatch read above, Her Majesty's Secretary of State for India sanctioned the establishment of an epigraphical survey of India, and the appointment for a period of three years of Mr. J. F. Fleet, of the Bombay Civil Service, to be Epigraphist to the Government of India. Mr. Fleet's duties, of which he assumed charge on the 17th January 1883, consist in the preparation and editing, with historical comments and indexes, of texts and translations of all ancient inscriptions discovered either on copper-plate grants or on stone.

2. In order to the successful carrying out of the work entrusted to Mr. Fleet, it is necessary that he should have the hearty co-operation of Local Governments and Administrations. The Governor-General in Council is confident that this co-operation, which is now invited, will be readily given, and accordingly desires that all Local Governments and Administrations will render Mr. Fleet every assistance that lies in their power, by forwarding to that officer (for inspection and return) original copper-plates that may be in their own records, or in local museums, when this can be done without risk of damage or loss; by procuring for him, when possible, the temporary loan of similar plates in the possession of private individuals; and by directing district officers to furnish him with any information which he may require relating to inscriptions which may exist in their districts.

3. To further aid the work, it seems necessary to take such precautions as may be possible to prevent the passing out of the country, by sale or otherwise, of inscribed plates or stones without the knowledge of the Epigraphist. His Excellency in Council would be glad if Local Governments and Administrations would issue the necessary instructions to secure this object, so that the Epigraphist may have an opportunity of informing himself of the contents of all ancient inscriptions which may be anywhere discovered, of taking copies of them, and of judging whether the originals are of sufficient interest and value to justify their purchase for the Government Museums in this country. District officers should be directed to put forward the claims of Government under Act VI of 1878 (the Treasure Trove Act) in cases to which that Act applies; and officers in all departments be requested to report to the district officer any discoveries which may come under their notice.

Order—

Ordered that a copy of this resolution, with copy of the despatch from the Secretary of State read above, be forwarded to all * Local Governments and Administrations for information and guidance.

* Madras.	Central Provinces.
Bombay.	British Burma.
Bengal.	Assam.
North-Western Provinces and Oudh.	Coorg.
Punjab.	Hyderabad.

Ordered, also, that a copy be forwarded to the Foreign department for the issue to the heads of Political Administrations of any further orders which may be deemed necessary in that department for the furtherance of the object in view; and that a copy be forwarded to the Revenue and Agricultural department.

(True Extract.)

(Signed) A. MACKENZIE,
Secy. to the Govt. of India.

To the Chief Secretary to Government.

Enclosure.

Despatch from Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India office, London, 21st September 1882, No. 146 (Statistics and Commerce).

I have considered in Council your Excellency's letter, dated the 9th of June, No. 157, on the subject of the establishment of an epigraphical survey of India, and of the appointment of Mr. J. F. Fleet, of the Bombay Civil Service, as Epigraphist.

2. In July 1881, the Director-General of the Archæological Survey proposed that active steps should be taken for the systematic arrangement and translation of the ancient inscriptions which have been collected in various parts of India, and recommended the employment of Mr. Fleet, of the Bombay Civil Service, in the publication of the texts and translations. On being called on by your Government to state the probable duration of such a special appointment, he estimated it at about ten years.

3. Mr. Fleet, on being asked by the Government of Bombay if he would accept the employment, and, if so, on what terms, expressed a hope that he would not be placed in a worse position than if he remained in the ordinary line of service, and that he might, therefore, receive pay and travelling allowance according to his rank therein.

4. Your Excellency is willing to supply Mr. Fleet's place by a suitable officer, and recommends that he be granted a salary of Rs. 1,200 a-month on commencing his new work, together with a travelling allowance of Rs. 10 a-day when it becomes necessary for him to visit any inscriptions on the spot, and that his pay be regulated in future according to the scale in the ordinary line of the service as he becomes eligible for promotion.

5. In forwarding with my despatch, No. 224 (Statistics and Commerce), of 29th December last, a letter from the President of the International Congress of Orientalists held at Berlin last year, proposing such an undertaking as is now in question, I expressly recognised that the promotion of inquiry into the sources of history, which in India largely consist of the contents of ancient inscriptions, formed at least a secondary duty of an enlightened Government, especially in a country where individuals with the means, leisure, qualifications, and tests for such investigations were rare. But my recognition of this was accompanied by a caution as to the necessity of judging the proposal transmitted to you deliberately, and on a review of the whole of the expenditure that is being incurred in connection with Indian archæology.

6. In your letter under reply no reference is made to the latter part of the question, nor, indeed, is any estimate given of the cost of the proposal submitted by your Excellency's Government. But, judging from the rate of pay now drawn by officers in the Bombay Civil Service, it would appear quite possible that Mr. Fleet might draw as salary during the next ten years not less than Rs. 2,36,000, which sum, therefore, would represent the cost of editing the inscriptions under the proposal now made, besides the charge for travelling allowance, establishment, contingencies, printing, and publication.

7. Apart, however, from these calculations, and even if they should be judged somewhat in excess of the probable truth, I cannot think that we should be justified in setting apart a member of the Civil Service to be devoted to work of this kind on a large salary for so long a period; nor indeed do I think that, in view to the desired object itself, the result of general experience is favorable to such a measure.

8. But it seems to be generally acknowledged that Mr. Fleet's qualifications for the work are of an altogether exceptional character, and that competent judges anticipate great results from

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his employment on it, whilst the tone of his own letter of 2nd December 1881, included among the correspondence which you transmit, intimates that his own expectations had been of no unreasonable kind.

9. I am willing, therefore, to sanction his employment on a fixed salary, and for a short term of years. The salary I would fix at Rs. 1,400 * a-month, with the travelling allowance proposed by you, and the term of his employment at three years, and no more.

N.B.—As far as can be learned, Mr. Fleet now draws Rs. 1,200 pay, with a permanent travelling allowance of Rs. 200, and Rs. 25 tentage.

10. But it is to be understood that this employment is subject to the condition that the Government of Bombay can arrange to spare him, and also that, after he shall have been so employed for one year, I shall expect to receive an early report of the results of his work for that year.

11. To make the most of Mr. Fleet's service during the sanctioned period, it will be well that he should be authorized to employ native scholars under his supervision, within some defined moderate limit of expense, to assist in the preparation of his materials.

12. It has indeed struck me that a work of this nature is precisely one on which it would be most desirable to turn native scholarship to account more prominently; and that among the many native students who receive instruction of a high class in our various educational institutions, we might fairly look for some qualified to take an important part in such tasks. It may be that there are none available at present who are qualified to carry out such an undertaking independently. But I should be glad if one of the results of Mr. Fleet's employment during the next three years should be the training of two or three native scholars in such habits of accuracy and critical judgment as should fit them hereafter for taking a prominent place in the prosecution of historical research.

ORDER—dated 13th March 1884, No. 520, Public.

Communicated to the Board of Revenue, to the Archæological Surveyor, Southern and Western India, and to the departments of the Secretariat.

2. The Right Honorable the Governor in Council desires all district officers to give their cordial co-operation and assistance to Mr. Fleet by forwarding to him such original copper-plates as may be available, by procuring for him where feasible the loan of similar plates in the possession of private persons, and by giving him such information as he may require relating to the inscriptions existing in their districts. They will also endeavour to carry out the instructions contained in paragraph 3 of the observations prefixed to the Proceedings read above, and will see that the Treasure Trove Act is worked whenever such a course may forward the ends of the epigraphical survey.

3. A copy of these Proceedings, with a copy of Mr. Sewell's "List of Antiquities," will be forwarded to Mr. Fleet for information.

(True Extract.)

E. F. WEBSTER,
Chief Secretary.

To the Board of Revenue.
" the Archæological Surveyor, Southern and Western India.
" the departments of the Secretariat.
" J. F. Fleet, Esq., with books.
" Dr. Bidie, Superintendent, Central Museum.
" R. Sewell, Esq.
" heads of departments.

ENDORSEMENT—dated 13th March 1884, No. 521, Public.

Copy to the Government of India, Home department.

E. F. WEBSTER,
Chief Secretary.

Exd. J. Wright.

Order thereon, 21st March 1884, No. 1313

Communicated to the Director of Revenue Settlement and Agriculture and to the Superintendent of Revenue Survey for information and guidance with reference to the last para of the Govt. of India's Resolution. True Extract

(Sd.) Sidney Laffan

Ind No 96/84

Govt. of (1884) Madras.

PUBLIC.

2¼

No 952

ommunicated to the Officers in charge of Settlement Parties
nd to the Agricultural Reporter

ept. of Rev. Sett. & Agrc.
ladras 7 April 1884

(By order)

[signature]
1st. Assistant

To
The Dy: Director of Reve
Settt Party No III.

Issued

Recd. *Encl.*

G.O., &c., 13th March 1884,
Nos. 520, 521.

MARCH.

Archæology.

Communicating, with instructions, resolution of Government of India regarding the appointment of Mr. J. F. Fleet, of the Bombay Civil Service, as Epigraphist to that Government.

25TH OCTOBER 1883, Nos. 1336, 1336A, REVENUE.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—again G.O., dated 15th March 1883, Mis. No. 1180.

READ—again G.O., dated 8th May 1883, Mis. No. 1901.

READ—also the following Proceedings of the Board of Revenue, dated 23rd April 1883, No. 1161:—

ABSTRACT.—Cancelling Board's Proceedings, dated 9th March 1883, No. 687, directing Collectors to open an extra column in the Adangal Account No. 4.

READ—also the following Proceedings of the Board of Revenue, dated 3rd October 1883, No. 2954:—

Read—the following G.O., dated 15th March 1883, Mis. No. 1180, Revenue:—

ABSTRACT.—Referring to the Director of Agriculture for report, in consultation with the Board of Revenue, letter from the Secretary to Government of India forwarding a despatch from the Secretary of State in regard to the compilation of agricultural statistics, and inviting opinion and suggestions.

Read—the following G.O., dated 8th May 1883, Mis. No. 1901, Revenue:—

ABSTRACT.—Referring to the Director of Agriculture for remark, in consultation with the Board, Resolution of the Government of India regarding the preparation of more trustworthy record of harvest yield.

Read—the following official memorandum from E. F. WEBSTER, Esq., Secretary to Government, Revenue Department, to the Secretary to the Board of Revenue, dated Ootacamund, 23rd May 1883, No. 160:—

ABSTRACT.—Inquiring how the Board intend complying with the requisition of the Government of India as to exhibiting in the Statement II-E the quantity and value of crops irrigated.

Read—the following letter from E. STACK, Esq., C.S., Director of Agriculture in Assam, to the Secretary to the Board of Revenue, dated Shillong, 4th July 1883, No. 62:—

ABSTRACT.—Advising despatch of two copies of a resolution of the Chief Commissioner of Assam on certain experiments in the outturn of crops in the year 1882-83.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to the Secretary to the Board of Revenue, dated Camp Battalagunta, 25th July 1883, No. 963 :—

I have the honor to submit the following remarks on the marginally-noted papers relating to the compilation of agricultural statistics and the preparation of more trustworthy records of harvest yields, which have been referred to me for report in consultation with the Board of Revenue.

G.O., Mis. No. 1180, dated 15th March 1883.
„ „ „ 1901, „ 8th May 1883.

2. The Government of India require, in the first place, that the discrepancies in the figures given in the tables under notice should be explained so far as explanation is possible.

As regards this Presidency, I have to observe that the "area cultivated" is given in the Secretary of State's Form A for British India at 31,056 square miles, or Acres 19,875,840 as against Acres 19,877,127 in the corresponding provincial statement. The difference between these two amounts is Acres 1,287, or say 2 square miles, a difference due in all probability to the omission of fractions.

The difference between the "cultivated area" of Acres 19,877,127 and the "cropped area" of Acres 21,014,021 of the Secretary of State's tables is large—Acres 1,136,894. An explanation in general terms of the discrepancies in the accounts as submitted was given by the Board of Revenue in a memorandum attached to their Proceedings of 14th October 1879, No. 2930-A. The differences were attributed to the omission (it is not stated from what) in certain cases of the "miscellaneous" area, the area of second crop and the cultivation in entire Inam villages. In this memorandum I have to remark there are given two contradictory directions relating to the assessment of Inams, one of which is, I think, erroneous. In paragraph 3 of the memorandum on Statement A (1) the Board say, "the figures given under assessment of Inam lands in the case of some districts represent only the quit-rent charged on the Inams, and in the case of others they properly represent the full revenue which would be payable to Government if the lands were not Inam." In paragraph 6 of their remarks on E (3) on the same page the Board write, "in one district the Collector has given under the head 'average assessment' the full assessment of Inams instead of their quit-rent."

The former of these instructions is in my opinion wrong, for the term "assessment" seems meant to imply the actual, not the potential, tax imposed on land, whether it be Government or whether it be Inam. A more particular examination of the figures has enabled me to reduce the discrepancy shown in the Secretary of State's figures very considerably. From his "cultivated area" there has been entirely omitted the area of second crop Acres 1,437,172. If this be added to his "cultivated area," the total is Acres 21,314,299, or Acres 300,278 in excess of the "cropped area" of the provincial statement—Acres 21,014,021. Examination of the district returns shows that in six districts—Bellary, Kurnool, Chingleput, Tanjore, Salem and South Canara—the figures for "cropped" and "cultivated" areas tally; that in eight more—Godávari, Nellore, South Arcot, Trichinopoly, Tinnevelly, Coimbatore, Nílgiris and Malabar—the discrepancies can be reconciled in the manner shown in the appended statement; and that in the remaining six districts, for which statistics were furnished, viz., Ganjam, Vizagapatam, Kistna, Cuddapah, North Arcot and Madura, no satisfactory explanation can be given. The net discrepancy for these six districts is an excess of Acres 65,744 in the "cultivated area" over the "cropped." This discrepancy is less than a seventeenth of that shown in the Secretary of States Form B. for British India.

3. Having thus explained the figures of the Madras statements, so far as they admit of explanation, I proceed to notice in their order the several matters adverted to in Mr. Secretary Buck's letter of the 23rd February 1883, and first as to the mode of dealing with Inams erroneously (so far as this Presidency is concerned) described generally as synonymous with "estates exempt from assessment." Inams consecrated to religion or charity are doubtless exempt from assessment, but the vast majority of Inams in this Presidency have been

Mr. Secretary Buck's letter of 23rd February. Paragraph 4 (*b*).

enfranchised and assessed to quit-rent. So far as Inams in Government villages are concerned, their agricultural condition is recorded in the village accounts in precisely the same manner as is that of Government lands. Of Inams in Zemindaris, as of Zemindaris themselves, we have no information. We cannot, as the law stands, compel information regarding Zemindaris, nor have we the means of testing the accuracy of any that may be voluntarily given. For this reason the Madras returns show merely the areas included in Zemindaris, but give no details of their agricultural conditions. A change in the law placing Zemindari Curnams under the authority of the Revenue administration, and providing for the control and scrutiny of their accounts by Government officers has been advocated; but, till the proposal has become law, it seems useless to attempt in these returns anything further for Zemindaris than is at present recorded.

Paragraph 4 (*c*).

(1.) The term "cultivated," as used in the Madras returns, includes only lands actually under the plough.

(2.) The Madras returns represent the facts of 1878-79, except in the case of one taluk of Ganjam for which the figures for the previous year 1877-78 were taken, those for 1878-79 not being available when the return was submitted.

Paragraph 5 (*d*).

There cannot, I think, be any difficulty in exhibiting "forest lands" separately.

Paragraph 6 (*f*).

In the Madras returns of cultivated products one hundred different kinds are separately enumerated under their appropriate heads. These embrace the principal products of the province, the minor ones being accounted for in the lump in their proper places. The only thing that I have to notice in regard to the list is, that under "Oils" lamp and castor oil are separately accounted for, though why they should be in a crop statement is not apparent, seeing that both are the produce of the same plants and the one merely the commercial refinement of the other.

Paragraph 8.

A census of agricultural stock is taken in this Presidency every five years. The last was taken in 1881-82.

Paragraph 11.

In this paragraph Mr. Buck refers to the "want of uniformity and the absence of clearly defined terms," which he quotes among others as reasons for dealing comprehensively with agricultural returns and improving their accuracy.

As examples of the want of uniformity in the present statistical tables, I need only point to the sub-division, differing without apparent reason of the terms "irrigated" and "unirrigated" in Statements A (1) and E (2); in the former "irrigated" is subdivided between "first and second crop," in the latter between irrigation from "Government works" and by "private individuals."

In the same statements the term "uncultivated area" is in the one sub-divided between "cultivable but not cultivated," "pasture and forest lands" and "barren or waste lands including Poramboke;" while in the other it is distributed between "grazing lands," "culturable" and "unculturable."

Statement E (2) again affords an example of the absence of clear definition in terms—what is to be included in the term "irrigated?" In the Madras Presidency it embraces not only artificial irrigation proper, but all lands from which what is called wet revenue is derived; it includes, therefore, not only irrigation artificially supplied, but also the rain-grown paddy lands of Malabar and Canara, and the "Manavari" (rain-fed) lands of every district in the Presidency that has not been resettled. These lands are classed and assessed as wet, because the only crop they grow is paddy, but they are not "irrigated." What, again, is to be included in the term "irrigated by private individuals?" Is it to include only lands classed and assessed as wet but irrigated from sources which Government neither controls nor maintains, or is it, as it ought, to embrace also irrigation from wells in lands that are classed and assessed as dry? Irrigation, again, is largely provided from Government works to Zemindaris and Inams free of charge; should not the statistical returns distinguish between the charged area and the free?

Mr. Secretary Buck's letter of 19th April 1883, No. 25.

4. In the second of his letters under notice Mr. Buck deals with the question of the preparation of more trustworthy records of harvest yields. It must be familiar to every one acquainted with the system of account obtaining in this Presidency that the record of its agricultural conditions, full and varied as it is in other respects, affords no information regarding the quantity and value of its yearly harvests. In a province, the revenue system of which is based on the assumed right of the Government to a share of every product that is grown, the defect may well seem strange, but it is stranger still that no attempt has been made to remedy it by the record of information which must be one of the surest gauges of the agricultural stability of the country. The importance of the information is everywhere recognized, the only difficulty is as to the means of obtaining it. In Bombay the information has hitherto been recorded by the village accountants, but they have been discredited and their returns pronounced untrustworthy, and it is proposed to substitute for their record the estimates of Mamlutdars and their staff made in accordance with certain prescribed formulæ. Recently in this Presidency the Board of Revenue sanctioned in their Proceedings, No. 687, dated 9th March 1883, the opening in the village accounts of a record of the quantity of harvest yields, but on further consideration (Proceedings, No. 1161, dated 23rd April 1883) cancelled their order on the ground that the "labor imposed on the village Curnams would be unduly heavy and could not be properly discharged by them." This was not the opinion of the Board as constituted in 1876 (see Proceedings, No. 739, dated 15th March 1876). The then Board when discussing these statistical records saw no difficulty in obtaining the requisite information by the agency of the village Curnams, provided they were sufficiently supervised by a competent staff of inspectors. It was pointed out that there was in every village an hereditary Curnam, "intelligent as a rule and capable of furnishing all particulars required in regard to the agriculture and commerce of his village." The duty of the inspectors was to be "to examine the accuracy of the statements furnished by the Curnams by inspection and experiments." They were "to examine the produce of a number of localities and compare the results with those given by the Curnams." Of the same opinion regarding the capacity and duties of the village Curnams were the framers of the revenue system of this Presidency. Regulation XXIX of 1802 prescribes that "Curnams shall keep true accounts of the gross produce of all lands," and shows how it is possible for them to do so by further prescribing that "Curnams shall be present at the beating out and at the measuring of the grain." This regulation applies, it is true, only to Zemindari villages, but it undoubtedly reflects the opinion of the administration of the day regarding the capacity and duties of a Curnam generally in respect of the record of harvest yields. I am of opinion that the record of harvest yields should, like all the other agricultural records of this Presidency, have its origin in the village, and I agree with the Board of 1876 in thinking that, with efficient supervision, the Curnam's record could be rendered perfectly trustworthy. Curnams and Revenue Inspectors in this Presidency are most of them men of no mean skill in estimating produce. The only question for decision is whether their estimates should be absolute, or have reference to a standard. The former is the method prescribed by law for Zemindari Curnams, and what a Zemindari Curnam must do, under the provisions of a legal enactment, it could not be difficult for a Government Curnam to do under administrative orders; the latter is the method proposed by the Bombay Government. The application of it would be easy in settled districts in respect of standard crops; the number of these is few,* however, and for all other crops a valuation would have to be made either generally for the district on the average of all soils, or, as in the case of settlement standards, for each variety of soil. The labor of the latter method would be enormous, and if the crop estimate is to be made with reference to a standard, I would counsel the adoption of the former.

* Wet lands ... White Paddy.

Dry lands ... ... Cholum. Cumbu. Ragi. Ariga. Varagoo. Black Paddy. Koraloo. Varijeloo. Horse-gram. Tobacco.

EXPLANATION of certain discrepancies in the Statistical Accounts of 1878-79.

Districts.	Area Cultivated, Statement A-1.			Area according to Crops, Statement D-1.	Difference.	Collector's explanations of the differences between entries in Columns 4 and 5.
	First Crop.	Second Crop.	Total.			
1	2	3	4	5	6	7
	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	
1. Ganjam ..	407,151	19,081	426,232	390,693	+ 35,539	Miscellaneous cultivation in Government villages and cultivation of minor Inams in Zemindari villages were omitted from the Crop Statement D-1.
2. Vizagapatam..	123,115	13,559	136,674	157,494	— 20,820	No explanation is forthcoming.
3. Godávari ..	880,681	44,534	925,215	970,777	— 45,562	Acres 37,884 on account of cultivation in Inam villages were not included in Statement A-1, and Acres 7,678 were repeated in Statement D-1 when several crops were cultivated together.
4. Kistna ..	1,710,781	5,584	1,716,365	1,778,830	— 62,465	Cultivation in Inam villages was not included in Statement A-1.
5. Nellore ..	795,779	20,691	816,470	818,830	— 2,360	Cultivation in Inam villages was omitted from Statement A-1.
6. Cuddapah ..	1,433,859	74,909	1,508,768	1,456,321	+ 52,447	Cultivation of Inam villages was not entered in the Crop Statement D-1.
7. Bellary ..	2,470,217	57,319	2,527,536	2,527,536	..	
8. Kurnool ..	1,499,547	13,015	1,512,562	1,512,562	..	
9. Madras ..	..	..	..	..	..	
10. Chingleput ..	516,950	62,054	579,004	579,004	..	
11. North Arcot ..	616,184	92,856	709,040	660,990	+ 48,050	No explanation is forthcoming.
12. South Arcot ..	1,154,089	130,701	1,284,790	1,308,442	— 23,652	Cultivation after the close of the official year was included in Crop Statement D-1.
13. Tanjore ..	1,171,804	62,290	1,234,094	1,234,094	..	
14. Trichinopoly..	926,319	65,267	991,586	916,393	+ 75,193	Cultivation of whole Inam villages Acres 52,004, and miscellaneous cultivation, Acres 23,189 were omitted from the Crop Statement D-1.
15. Madura ..	758,107	70,355	828,462	815,469	+ 12,993	The accounts were admittedly prepared on unsatisfactory data and no satisfactory explanation is forthcoming.
16. Tinnevelly ..	1,089,493	141,605	1,231,098	1,117,751	+ 113,347	Cultivation of whole Inam villages was omitted from the Crop Statement D-1.
17. Coimbatore ..	2,063,627	134,752	2,198,379	2,178,825	+ 19,554	Cultivation of whole Inam villages Acres 8,669, and miscellaneous cultivation Acres 10,885 were omitted from the Crop Statement D-1.
18. Nilgiris ..	65,598	3,050	68,648	65,598	+ 3,050	Second-crop area was not included in the crop statement.
19. Salem ..	1,011,709	114,473	1,126,182	1,126,182	..	
20. South Canara..	379,728	201,426	581,154	581,154	..	
21. Malabar ..	802,389	109,651	912,040	817,076	+ 94,964	Acres 14,687 cultivated free of assessment were not included in the Statement A-1, and the whole of the second-crop area was omitted from the Crop Statement D-1.
Total ..	19,877,127	1,437,172	21,314,299	21,014,021	+ 300,278	

Resolution—dated 3rd October 1883, No. 2954.

The Board concur generally in the explanations and remarks of the Director of Agriculture as contained in the first three paragraphs of his letter, No. 963, of the 25th July 1883, which dispose of the points raised in Mr. Secretary Buck's circular letter of the 23rd February 1883, No. 13 (Statistics), relative to the discrepancies in existing agricultural statistics. In connection with this subject the Board note with

much satisfaction that it is expressly declared in the Secretary of State's despatch of the 4th May 1882, No. 25 R (on which Mr. Buck's letter was based), that no additional returns are required from the already overworked district and village establishments, but merely modifications in existing returns such as shall ensure uniformity and accuracy in general tabulation.

2. In the last paragraph of his letter, the Director deals with the question of the preparation of more trustworthy records of harvest yields, to which Mr. Secretary Buck's second circular letter, No. 25 (Statistics), dated 19th April 1883, to the address of the Secretary to the Government of Bombay refers. This letter is forwarded to all Local Governments by the Government of India, with an intimation that the measures proposed to be taken by the Government of Bombay in regard to the classification of crops and the ascertainment of produce merit the attentive consideration of other Governments, who are requested to state how far these proposals are capable of adoption, more especially as to the proposed ascertainment of formulæ for determining the average outturn of crops, and as to whether similar standards might not be drawn up for each province.

3. The proposals of the Bombay Government are to appoint a Committee of experts consisting of Survey and Settlement officers of some experience, aided by the Superintendents of Model Farms, and to entrust to this Committee the task of drawing up a set of formulæ for estimating the produce of crops under all circumstances, which would hold good till corrected afterwards, at leisure, by the light of actual experiments. These proposals were made to the Bombay Government by their three Revenue Commissioners and their Survey and Settlement Commissioner jointly, and were accepted by them. They were based on the conclusion that any estimate of production made by the village officers was not only not to be depended on, but was likely to be misleading, especially in seasons when, owing to any expectation of remissions, it might be to the fancied interest of the ryots to have the yields of their crops underestimated or misrepresented.

4. Briefly, Mr. Wilson prefers to adopt for this Presidency the plan discredited, after experience, in Bombay, and he supports his views by arguments entitled to full and careful consideration. The Board, however, differ from him on this point, and consider that the plan of standard outturns for each district is the best. Ample materials of the most accurate and trustworthy character exist among the records of the Revenue Settlement Department from which the computation of a set of tables of average outturns of all the principal food-crops in all the settled districts of this Presidency can be worked out without much difficulty, and these tables might be applied under the supervision of the taluk officials to returns of a very simple character to be recorded by village Curnams shortly before each crop is being harvested. The result would be that the average yield of each crop in each district could be estimated with an approximate accuracy which would leave little to be desired. The standards might at the same time be applied to districts adjoining those settled ones in respect of which they have been framed, until they themselves have been settled and fresh standards worked out for them.

5. The Board quite agree with the Director that the estimation of outturns should have its origin in the village, but they would not go the length of leaving it to the village officers to decide absolutely the quantity in maunds and seers of the yield of every crop. In some instances the village officials might be able to do this fairly well, but the causes which tended to make the Bombay village estimates untrustworthy operate with equal force in this Presidency to render such estimates generally unreliable. The Board would therefore only throw on the village Curnam the duty of stating in his Account No. 4 (the Adangal) in a column to be added for the purpose, his idea of the *quality* of each crop on each field, shortly before it is gathered, according to one of the four following simple standards, viz., "*full*" (or above average), "*average*," "*middling*" (or indifferent) and "*bad*." These might be expressed in the proper column either in the words themselves or by the figures 1, 2, 3 or 4, as the case might be, and could be done quickly and without more than a little examination of the standing crop. The Revenue Inspector would check some of these estimates, and then the taluk officials

would apply to them the district standards. The village standard might be thus represented for all crops in annas of a rupee. :—

Annas in the Rupee.	
1 to 4	Bad.
5 to 8	Middling.
9 to 12	Fair average.
13 to 16	Very good.

The district standards would then be applied. They would have been worked out thus: Supposing that there were five classes of rice-land in a district, and that the fair average yield of one acre of each kind varied from 1,000 to 500 lb., and that the average of the 5 was 700 lb., that would constitute the fair average for paddy for the whole district. Then to match the village standards, the district standards would be drawn up somewhat as below * :—

* This, of course, is a purely imaginary case.

Bad	150 lb. per acre.
Middling	300 „ „
Fair average	700 „ „
Very good	900 „ „

Then all the areas of rice-land in any village marked 4 in the Adangal account would be added together and multiplied by 150, and the total of the other classes of areas by 300, 700 or 900 as the case might be, the total result being the estimated outturn of paddy in pounds of the whole village. In the same way the outturns of all other crops might be calculated, a separate standard being drawn up for each crop and for each district.

6. It is true, as pointed out by Mr. Wilson, that early in March last, before either of the Government of India Resolutions now under reply was received by the Board, they disposed of a proposal of his that orders should be at once issued that all village Curnams should enter in their No. 1 account the gross yield of every crop on every field in their respective villages, in terms of seers of 80 tolas, and that the Board acceded to the request. Soon afterwards, however, they recalled their orders on its being represented to them that the additional labor thus thrown on the village officers would be very great, and that the duty would not be properly discharged by them. Nor do they consider that there is any very great difference between the opinion then recorded by them and the opinion they recorded in 1876, which the Director refers to as supporting his views; for though the then Board admitted that machinery already existed for collecting to a great extent the information required, they qualified the remark by adding that systematic and efficient supervision would be requisite to direct the operations and reduce the information to shape, adding that though village accountants were, as a rule, intelligent, their returns were not always trustworthy. Moreover, they then distinctly stated their conviction that neither existing establishments in their own office nor in the districts could undertake the work of collecting and compiling these statistics without detriment to their other duties, and they estimated the cost of the additional establishments required for the purpose at about $2\frac{1}{2}$ lakhs of rupees.

7. For the efficient carrying out of the scheme now suggested by the Board, a better class and a larger number of Revenue Inspectors, than now exist, are essential. Proposals to increase their number on general administrative grounds are now before Government, and, in disposing of these, the Board trust that the increased need for their entertainment, entailed by the suggestions now made, will not be lost sight of.

8. In conclusion, the Board think it is only due to this Presidency, the Revenue administration of which they are appointed to superintend, to affirm, as they now do, that in the matter of agricultural statistics the Madras Presidency is, and has long been, far ahead of the rest of India. The fact is admitted by the Famine Commission at page 53 of Appendix I of their Report, where they state that the agricultural statistics of this Presidency are fairly complete, while in Bengal they are absolutely non-existent, and in most of the other provinces of India rudimentary. The ancient

custom which prevailed here of recording the quantity of the Government share of the produce, naturally fell into abeyance when money assessments were substituted for grain-rents, but the Madras system of agricultural record is so good that the Board feel confident that fairly accurate returns of crop outturns will be regularly recorded for this Presidency long before any such end is attained in any other part of India, and that, too, without much trouble, provided the taluk establishments are sufficiently strengthened to admit of that supervision being exercised in this matter which is so essential to success.

(True Extract.)

(Signed) E. GIBSON,
Acting Secretary.

To the Secretary to Government, Revenue Department, with copy of letter from the Director of Revenue Settlement and Agriculture, dated 25th July 1883, No. 963.

Copy to the Director of Revenue Settlement and Agriculture.

ORDER—dated 25th October 1883, No. 1336, Revenue.

Miscellaneous.

In their Proceedings, dated 3rd October, read above, the Board of Revenue and Director of Agriculture submit the reports called for on the circulars of the Government of India in the Agricultural Department noted in the margin,* and at the same time reply to the enquiry † made as to how they can best arrange to comply with the wish ‡ expressed by that Government last year to have the gross yield of each crop shown in the return of irrigational statistics.

* No. 13, dated 23rd February 1883.
„ 25, „ 19th April 1883.

† Official Memorandum, No. 160, dated 23rd May 1883.

‡ Letter, No. 36-I, dated 3rd February 1883.

2. In paragraph 12 of the circular of the 23rd February 1883 it is stated that, on receipt of the opinions of Local Governments, the Government of India think that the questions referred might be best dealt with by a committee of officers assembled under the orders of the Government of India in which each Government would be represented. Arrangements for the proposed conference, which the Director of Agriculture has been deputed to attend, have since been matured, and the Right Honorable the Governor in Council, accepting the view that a final settlement of the point referred can be most conveniently arrived at when it meets at Calcutta in December next, resolves to communicate the Board's Proceedings and the Director's letter to the Government of India with a general expression of the opinions of this Government in regard to the questions which will come under consideration, in the belief that the information therein contained will facilitate the attainment of the object in view and assist the committee in arriving at correct conclusions as to the extent to which the system of agricultural statistics observed in this Presidency may be susceptible of modification and amendment.

G.O., 12th September 1883, No. 1113.

3. Mr. Wilson has, it is thought, satisfactorily explained, so far as they admit of explanation, the discrepancies noticed in the preface to the agricultural statistics compiled in the India Office, and his remarks on the memorandum appended to the Board's Proceedings in which those returns were, so far as this Presidency is concerned, orginally contained deserve attention. For instance, there can be no question that the figures given under *assessment of inam lands* should not represent the full land-tax which would be payable to Government if the lands were not inam, but only the quit-rent chargeable on such lands. In practice, however, some diversity of opinion on this subject appears to have obtained among the district

14th October 1879, No. 2930-A.

officers which must *pro tanto* have injuriously affected the value and uniformity of the figures furnished. Again, with reference to the statistical returns of inams in Zemindaris and of permanently assessed estates, the Government endorse the opinion of the Director of Agriculture that in the existing state of the law, they are utterly unreliable, but are assured that this element of inaccuracy will be removed as soon as the Zemindari Curnams Bill, now before the Legislative Council, becomes law, and as supposed by the Government of India arrangements for exhibiting forest lands separately can be easily made by the Board of Revenue in whom, under the new organization, the general control over forests is vested. In regard to the remark made at the end of paragraph 11, the Government observe that the Agricultural Department in this Presidency has already been charged with the supervision and final compilation of agricultural statistics.

Circular, No. 25, dated 19th April 1883.

4. Turning to the second statistical circular under reference, the Government are inclined to give the matured views of the Board of Revenue in regard to the best mode of securing a correct record of harvest yields the preference over the system advocated by Mr. Wilson. The latter, if conscientiously carried out, would entail much additional work on the already overtasked village establishment and to insure any thing like reliable returns would necessitate the employment of a very expensive supervising agency. On the other hand, the comparison of the season's outturn with a standard previously determined with care as proposed by the Board would involve, to a practised operator, little more labor than a walk over the ground and the results returned could be checked with equal facility by the inspecting officer. Having in view the proposed increase to the taluk establishment now under consideration the Government agree with the Board in thinking that in this manner the outturn of every crop in a village might be periodically estimated with sufficient accuracy for statistical purposes and are of opinion that the returns would in practice be found more reliable than those resulting from the system favored by Mr. Wilson, and they have only to add their opinion that, in whatever mode the results are arrived at, the estimate should distinguish between the outturn of each cultivating season.

No. 739, dated 15th March 1876.
,, 2930A, ,, 14th October 1879.

5. With these remarks the Government leave the further consideration of the improvement of the returns of agricultural statistics to the committee appointed to consider the question. The Board will be requested to forward copies of their Proceedings noted in the margin to the Government of India in the Revenue and Agricultural Department.

(True Extract.)

(Signed) E. F. WEBSTER,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.

Endorsement, No. 1336-A.

Copy to Government of India, Revenue and Agricultural Department.

(Signed) E. F. WEBSTER,
Secretary to Government.

Exd. E. Fernandez.

Copies.

In No. 1628/83

Govt. of (1883) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 25th October 1883, Nos. 1336, 1336A.

No 784

[Co]mmunicated to the Officers in charge of Settlement Parties [and] to the Agricultural Reporter

[Dep]t. of Rev. Sett. & Agre.
[Ma]dras 25 March 1884

(By order)

Sheapanate
1st. Assistant

[T]he Dy. Director of Rev.
Settt. Party No. III

OCTOBER

Agricultural Statistics.

Passing orders on Board's Proceedings concerning the improvement of —.

22ND FEBRUARY 1884, No. 258, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 29th January 1884, No. 299 :—

Read—the following letter from J. F. PRICE, Esq., Collector of Chingleput, to the Secretary to the Board of Revenue, dated Saidápet, 19th December 1883, No. 715 :—

Adverting to the concluding portion of paragraph 6, G.O., No. 1373, dated 7th November last, communicated in the Board's Proceedings, No. 3711, dated 7th instant, I have the honor to state that, as I take a considerable interest in renewing or encouraging the special manufactures of my district, and as I personally know the weavers of the Arani muslins very well, I have often talked to them on the subject of cheapening their rates, assuring them that if they did, I could get them many more orders than I have, and help on what is, I fear, a dying industry.

2. It is, however, as the weavers themselves say, by no means an easy task to do this. I believe myself that their profit on a muslin is by no means outrageous, and that the percentage on capital invested is not really so great as that which the English manufacturer obtains upon his machine-made goods.

3. The whole of the work is done by hand and requires the greatest care. Newly picked cotton cannot be used, so it is said ; it has to be cleaned, &c., by hand, and the spinning of the thread, more delicate than a hair, is a work which involves both time, skill and labor. The thread, to begin with, is therefore very expensive. I cannot at this moment remember the exact cost, but I know that it is large. It takes two months to weave one muslin of sixteen yards, and there are certain conditions of the atmosphere which, on account of the extreme thinness of the thread, render the work most tedious and difficult. A single man cannot weave ; he must have an assistant. To all this has to be added the value of the heavy gold border, which is of superior quality. This might certainly be done away with, but an Arani weaver would not consider a muslin finished unless it had the border, and he would regard the article, deprived of this, quite unsaleable, as it probably would be amongst natives. When all this is taken into consideration, I think that it will be apparent that hand-work of the marvellous fineness of the Arani muslins can never be other than comparatively costly, and that it can never successfully compete with the produce of English machine looms.

4. One might attempt to introduce a coarser kind of muslin, but the weavers would look down upon it, and the leading workmen would not make it, as they, being a very conservative set and very proud of their art, would consider a fabric, other than what they have been accustomed to turn out, a disgrace to their reputations.

Resolution—dated 29th January 1884, No. 299.

Submitted for the information of Government.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.

Copy to the Collector of Chingleput.
" " Director of Revenue Settlement and Agriculture.

ORDER—dated 22nd February 1884, No. 258, Revenue.

Miscellaneous.

It was not the intention of Government to suggest that Arani muslins ought not to command high prices, or that they can ever be expected to compete successfully with machine-made goods in the market for which the latter are intended. The question is simply whether the prices asked are not out of all proportion to the cost of production and such as reasonable persons desirous of purchasing such fabrics cannot be expected to pay. It is clear that if such is the case—and the Government are by no means satisfied that it is not—the industry must go to ruin. The Collector should endeavour to ascertain by inquiry how the prices demanded by the Arani weavers compare with those of Dacca and other hand-made muslins.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

70 Copies.

Vide No 666/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

No 553C

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter.

Dept. of Rev. Sett. & Agre. } Madras 6 March 1884 }

(By order)

[signature]
1st. Assistant

To
The Deputy Director of
Rev: Settt. Party No III

G.O., 22nd February 1884, No. 258.

FEBRUARY.

Arani Muslin.

Requesting that inquiry be made as to how the prices demanded for — compare with those of Dacca and other hand-made muslins.

Registered

223

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 8th November 1883, No. 3362:—

READ—the following letter from J. S. GAMBLE, Esq., Conservator of Forests, Northern Circle, to the Secretary to the Board of Revenue, dated Coonoor, 22nd September 1883, No. 1002:—

I have the honor to submit Mr. Hutchins' report on the growth of the Casuarina plantations on the Nellore coast. I regret the delay which has taken place in its submission, due to my having had to go carefully over several of the calculations, and to my wish to visit the plantations themselves. I visited and went carefully through the Nellore plantations during the months of July and August, and here I wish to record my regret that Mr. Hutchins did not inspect those at Ramapatam, Kothapatam and Kanuparthi in the Kandukúr and Ongole taluks. From paragraph 12 of his report he seems to have been under the impression that they were not worth visiting; but in this I disagree with him, for there are many blocks of very considerable interest in all of them and they are certainly as good if not better than Tumalapenta. They could easily have been inspected, as those at Ramapatam and Kanuparthi are alongside of, and the Kothapatam ones only a short distance off from, the canal. There are some too of those in the Kistna district which would have repaid examination. I do not think that the plantations at Tumalapenta were good ones to choose in which to take the chief measurements. They have the advantage of being planted further apart, but they are of very small area indeed (the experimental plots) and the trees have suffered greatly from wind, many being broken and damaged.

2. However, the measurements made will be of value and the record may perhaps be supplemented hereafter, as the plantations grow older, by further details and especially in the areas planted in the last few years in all the southern plantations. Some of these later plantings especially at Dugarázpatam, Kottapatam (Gúdúr) and Varani are looking remarkably well, the better the closer they are to the sea. There can be no doubt but that the ill-success of many of the older blocks is simply due to bad planting, and to the surface watering causing the roots to tie themselves up in knots near the surface instead of quickly sending down a proper taproot. Near wells, the growth is always good, the trees on the margin being usually several times larger than those in the rest of the plantations, and indeed there are some places where the plantations are now simply reduced to groups round the wells and nothing more. The transplanting in the nurseries was often done much on the same principle as is carried out by villagers in transplanting rice, and it is not a matter of surprise that the plan suitable enough for the annual paddy crop is scarcely so for trees destined to give timber.

3. Henceforth a careful record will be kept of receipts and expenditure, of the amounts cut in the various compartments and the operations conducted in them, and early steps will be taken to survey them and afford reliable statements of area. Draft notification under Section 4 of the Madras Forest Act, proposing to constitute them, with adjoining lands for extension, reserved forests, is now being submitted to the Board. As at present given, the areas have merely been calculated on the number of plants put down and are consequently inaccurate. Good maps and comparatively accurate area statements are absolutely necessary for the working plans we must now prepare and no time must be lost in their preparation. A native surveyor with a small temporary staff under Mr. Vincent's control will probably suffice to get them quickly surveyed and sufficiently good maps prepared, and proposals on this subject will be submitted shortly.

4. A list of the Nellore plantations prepared by Somasundra Mudali, Sub-Assistant Conservator, is appended to Mr. Hutchins' report. It does not, however, give the receipts and the amount cut at various times. The receipts of the different compartments cannot be ascertained, as hitherto all fellings in any one plantation have been lumped together and sent to Madras for sale; but the next annual report of the Nellore district might very usefully give a table with the receipts and expenditure against each plantation as nearly as can be ascertained, the receipts for the compartments being apportioned by the district forest officer as nearly as possible.

5. From the information given in the report and put together in a résumé at page 16, it will be seen that, considering only the regular plantations and not the small plots, the annual production of wood per acre of closely planted Casuarina three to nine years old varies from 2·6 to 6·3 tons, the average being 4·5. And it is probable that if, until more accurate data are available, we estimate the annual increase of wood per acre up to an age of ten years as four and a half tons, we shall be under the truth rather than over it. I feel sure that many of the Madras private plantations will, for the same age, give more. In paragraph 25 of the report it is stated that Mr. Lushington found the acre-increment of a Madras plantation thirteen years old to be three and a half tons, but it is not stated what thinnings had been made, and how much had been removed by loppings and cleaning of ground shoots. Mr. Wooldridge's calculations made in South Arcot give 4·5 tons at eight years of age, which is the age at which I understand it is considered most profitable to cut the plantations near Madras. Mr. Lushington's measurements, though insufficient for a real basis of calculation, seem to point to the decrease of the acre-increment after ten years, and ten years is the term of rotation which I would recommend to be applied to the Nellore plantations, at any rate until further experience and greater accuracy of statistics enable us to reconsider the question.

6. The areas which so far as our present rough area-estimates allow us to judge, we possess of various ages in the chief plantations, are shown as follows, estimating for the "additional plantations" and last year's plantings:—

Plantations.	Ten years planted, 1873.	Nine years planted, 1874.*	Eight years planted, 1875.	Seven years planted, 1876.	Six years planted, 1877.	Five years planted, 1878.	Four years planted, 1879.	Three years planted, 1880.	Two years planted, 1881.	One year planted, 1882.	
Dugarázapatam.	50	100	40	..	..	..	..	50	100	10	350
Kottapatam ..	30	60	40	..	..	..	..	50	140	50	370
Tamminapatam ..	60	110	60	..	..	..	..	60	160	80	530
Utakur	..	..	40	..	..	..	..	40	100	..	180
Varani	50	100	50	..	..	..	..	50	100	..	350
Tumalapenta ..	20	..	17	..	..	17	..	..	..	..	54
Ramapatam ..	13	..	14	..	..	13	..	..	..	..	40
Kothapatam ..	..	10	..	15	10	..	..	..	..	..	35
Kanuparthi ..	5	..	44	..	..	..	..	..	..	..	49
Total ..	228	380	305	15	10	30	..	250	600	140	1,958

* *Note.*—"1874" means the autumn of that year, but where areas were planted in January or February of 1875, they are classed as 1874 and so with the rest.

7. It will be noticed that there are three periods: (i) 8 to 10 years old with 913 acres workable; (ii) 4 to 7 years old with only 55 acres; and (iii) 1 to 3 years with 990 acres. Now supposing that 10 years is the age of cutting, the above table shows that we can probably cut 200 acres per year, allowing for small future extensions. If, however, we were to do this we should find that after the fourth year of full fellings, only 138 acres were available for the fifth, 30 for the sixth, and none for the seventh, as the lowest period group would not yet be fit for working. The lowest group will however give some thinnings, say, the equivalent of 30 acres a year, after four years, so that the area for working in the first 7 years will be—

10 years old	228	= 228
9 ,, ,, ...	380	= 380
8 ,, ,, ...	305	= 305
7 ,, ,, ...	15+30	= 45
6 ,, ,, ...	10+30	= 40
5 ,, ,, ...	30+30	= 60
6 ,, ,, ...	0+30	= 30
		1,088

and we may allow instead of 5 years at 200 acres and 1 at 58 and 1 at 30—7 years at 155 acres each. We may therefore estimate that (always assuming the correctness of the area statements) we are safe in cutting 155 acres yearly, during the next 7 years, the cuttings to be as follows:—

—	10 years old.	9 years old.	8 years old.	5 to 7 years old.	Thinnings.	Total.
	ACRES.	ACRES.	ACRES.			
1883	155	...	...	...	...	155
1884	73	82	...	...	...	155
1885	...	155	...	...	...	155
1886	...	125	...	...	30	155
1887	...	18	107	...	30	155
1888	...	...	125	...	30	155
1889	...	...	73	55	30	158
Total ..	228	380	305	55	120	1,088

8. In the above calculation the increase of growth in several of the plantations which are not to be cut till some two or three years after their maturity has not been considered. When we have the areas accurately ascertained, it will be possible to revise the calculation and I would suggest that Mr. Vincent should then prepare a working plan. As there is every reason to think that the areas here given are too high, it will be best perhaps for the present year to cut a little less than the 155 acres, say 120. But assuming the statistics as correct and applying the results of Mr. Hutchins' measurements, we should be able to cut 155 acres yearly of 10 years old plantation giving $10 \times 4 \cdot 5 = 45$ tons per acre, *i.e.*, about 7,000 tons of wood a year. If the plantations were all in good condition, it is probable that we should easily get this, but some of them and especially the older plantations at Tamminapatam, Kottapatam (Gúdúr) and Dugarázpatam have suffered from the dying out of many trees, and others are in poor growth, so that it will be best to remain on the safe side and estimate the yearly outturn at 5,000 tons, at any rate for the next seven years.

9. This wood must of necessity be sent to Madras for sale, for, as is well known, the native consumers will not purchase Casuarina wood for fuel if it is possible to

get any other kind. It may be possible to dispose of small quantities in Nellore and Ongole, but the greater proportion must go to Madras for sale, where it may possibly fetch a *net* price of Rs. 5 per ton, *i.e.*, 25,000 rupees per year. The cost of the plantations up to date has been, according to Somasundra Mudali's table, and, as before, omitting minor areas, very nearly 2 lakhs, so that the plantations may be expected to yield 12½ per cent. interest on the capital. This does not however account for cost of establishments which will probably reduce the rate to 10 per cent.

10. While referring to the cost I would mention that the rate of planting per acre has lately fallen considerably, the figures of Somasundra Mudali's list, corrected up to December 31, 1882, giving Rs. 66 per acre as against Rs. 128 given in paragraph 342 of Mr. Brandis' suggestions.

From statements given me in Nellore the cost of the 1880 and 1881 plantations up to the 31st March 1883 had been per acre on an average :—

	RS.
1880	41
1881	18

The 1880 plantations at any rate will not require now much more expense in watering and the later made ones are being now managed more economically, so that there is not much fear that the cost per acre of those made in and since 1880 will go over Rs. 50, while there is every probability of its being much less, at any rate for future years.

11. The results of Mr. Hutchins' experiments to determine the form factor of Casuarina are very interesting and are explained in paragraph 27. The form factor as given in the table at page 16 varies in the plantations from 0·52 to 0·67, the average being 0·58.

12. The experiments of the weight of Casuarina wood are also valuable ; they give the result as follows :—

Green wood 69 lb. per cubic foot.
Dry ,, 45 ,, ,,

both with bark, which may account for the low value for dry wood compared with the 55 lb. given in Skinner's "Description and Strength of Indian Timber," which was calculated on large pieces of squared dry timber afterwards used to determine the co-efficients of transverse strength and elasticity, and may be taken as a fair value for the cubic foot of seasoned timber.

ENCLOSURES.

From D. E. HUTCHINS, Esq., Deputy Conservator of Forests, Special Duty, to J. S. GAMBLE, Esq., Conservator of Forests, Northern Circle, dated Madras, 7th March 1883.

I have the honor to submit the report and tables relating to the growth of Casuarina on the coast, together with the tables and note of the growth of Casuarina in Mysore returned to me for reference.*

* Also draft Report of the Nílgiri Plantations.

If desired, I shall be happy to correct the proofs of the Nellore work either on my return to Bengal or while passing Madras on my way thither about the 10th June next.

REPORT ON THE MEASUREMENT OF RATES OF GROWTH OF CASUARINA IN THE NELLORE DISTRICT.

By D. E. HUTCHINS, *Deputy Conservator of Forests, on Special Duty, dated Madras, 7th March* 1883.

THE work, of which I have now the honor to submit the report, was begun on the 26th January. I arrived at Nellore on the 20th instant, unfortunately to find the Collector and the Wood Overseer both absent in the district. The Collector returned to Nellore on the 24th instant and the Wood Overseer joined me on the 28th. I have to thank Mr. Lee-Warner for every assistance and Somasundram Mudaliar for valuable aid rendered during the whole time that I remained in the district. This report consists, *first*, of a brief description of each of the plantations visited; *second*, a short discussion of the different values obtained of Form-factors of Acre-increments and of Individual-increments.

2. A statement appended, supplied by the Jungle Conservancy Department, gives the locality, size, age, and other particulars of the Casuarina plantation in the Nellore District. It will be noticed in this statement that the oldest of the plantations of large size, and of which the age is certain, having been planted by the Jungle Conservancy Department is not more than nine years of age; and the history of that year's planting is a melancholy one. The planting in that year was done 9 feet × 9 feet, a distance which may be looked on as approaching the minimum distance at which Casuarinas can be planted if it is to yield a good Acre-increment without severe thinning. After the 9 feet × 9 feet planting was finished, an order came from the Collector to put in intermediate planting, one plant between every two, thus reducing the planting to 4½ feet × 4½ feet and quadrupling the number of trees per acre. It is a marked property of Casuarina that the tree is intolerant of shade, and thus this intermediate planting, being a year younger than the original 9 feet × 9 feet planting, was in great measure suppressed by the first planting. But the difference in age being usually not more than a year, the suppression was only partial, and the result is now that the nine years old planting all through the district presents a bad appearance, and is too irregular to afford Sample-areas to determine the rates of growth of closely-grown Casuarina at that age. Thus the oldest of my Sample-areas, taken from large blocks of planting, are only eight years of age. The rates of growth at other ages were determined as opportunity offered, as is detailed in speaking of each plantation separately. The subsequent year's plantings in the large plantations up to three years ago is all at this strange distance apart of 4½ feet × 4½ feet, or 2,178 to the acre, so that all the Sample-areas taken in the large plantations labor under the defect of having been planted excessively close.

3. On the 26th January I visited the *Alipuram* plantation with the Collector. This plantation is fifteen years of age, 11 miles inland, and favorably situated in the bed of the Pennér river. Unfortunately I found that all the good trees had been felled and the remaining stock poor and too irregular for the determination of rates of growth.

4. I then proceeded north by canal to the *Utakur* and *Varni* plantations. These were the first plantations I had seen of the very close planting that has been followed in the Nellore District. I was very unfavorably impressed with their appearance, and proceeded further north to the *Tumalapenta* plantation before beginning measurements.

The *Utakur* and *Varni* plantations, which are close together, and practically one plantation, are on the landward side of the Buckingham Canal, and rather farther from the sea than the other large plantations. The growth in these plantations is regular; the older planting looks the better at *Utakur*, the younger at *Varni*, but how the trees have been dwarfed by overcrowding in these plantations is evident from a comparison between the sizes of the trees on the margin and of inner

trees. Here, as in all the plantations, a striking feature is the improved growth of trees round the margin of wells. These wells are cup-shaped, about 4 yards in diameter, and from 4 to 10 feet deep, according to the level of the subsoil water. They are scattered throughout the whole area of the Casuarina plantations, sometimes so thickly as to occupy about one-fifth of the area. On an average from one-tenth to one-twentieth of the total area of the Coast Casuarina plantations is occupied by wells. The trees fringing the wells are usually nearly double the general size of the trees around. The wells being of small diameter, the large fringing trees close, and there is thus little or no break in the canopy, and consequently no real loss of area from the plantation. Four causes probably tend to promote the very remarkable growth of these trees fringing the wells:—*First*, increased space; *second*, a slightly higher level of subsoil moisture; *third*, the effect of a pit in mixing the earth; *fourth*, the evaporation from the surface of the wells mitigating the dry land wind. The first reason is of obvious importance. A glance at the Individual-increment shown in these tables will show how the growth of individual trees has suffered from over-crowding. At the Dugarázpatnam plantation the average cubic contents of the margin trees was to the average cubic content of the inner trees. As regards the second reason, the slightest rise in the level of the soil and consequent lowering of the level of subsoil water is everywhere marked by a less favorable growth, and it is probable that the surface of the water within the wells is higher than the water level outside the wells. As regards the third reason, one of the several undoubted advantages of pitting in planting is the thorough mixing of the soil; the large trees around the wells are on a mixed soil composed largely of the soil thrown up from a depth of 6 to 10 feet in digging the well. In support of the fourth reason, it may be noticed as apparently established that a strip of Casuarina planting exposed on one side to the moist sea breeze, on the other to the dry land wind, has the better growth on the sea side.

The stacking of firewood in the Varni and other plantations is done with commendable neatness. The cost of carriage of firewood from Varni to Madras, 118 miles, is only Rs. 3 per ton, the firewood selling in Madras at Rs. 10 per ton; preparation costs on an average Annas 12 per ton. Even roots can be stubbed up, sent to Madras from this distance, and sold at a small profit. It is remunerative also to send to the Madras market twigs and the smallest wood, which is done up into neat bundles convenient for stowing on the boats.

5. From *Utakur* I proceeded north to the *Tumalapenta* plantation, which is at the 140th milestone of the Buckingham Canal: a long narrow strip of planting stretching for $1\frac{1}{2}$ miles along the dunes of the coast, within 50 yards of the sea; soil, the deepest and whitest of loose sand. *Tumalapenta* is a typical coast plantation. The subsoil moisture, judging from the water in the wells, is here at a depth of 1 or 2 feet more than the average of other plantations visited. To this, and to the uniformly poor silicious soil, it is probably due that the growth in the *Tumalapenta* plantation is less rapid, but more regular than in that of any other plantation visited. *Tumalapenta* is the only plantation in which the whole of the planted area may be reckoned on as equal to the Sample-area. The plantation consists of three blocks of planting aggregating 49 acres, five, seven and nine years old, respectively, and of eight small experimental plots of planting, particulars of which are given in the jungle conservancy statement appended to this report. Of these experimental plots, three, which had been wide planted, and which show now a regular growth, were measured, the Sample-areas being taken as large as the size of the plots permitted. In the three large blocks of planting, Sample-areas of an acre each were taken, the ages being well graduated—five, seven, and nine years, respectively. The Sample-areas measured are referred to as A, B, C, D, E, F.

SAMPLE AREA A OF TUMALAPENTA.

6. This plot is one of those originally planted as an experiment, in order to test the best distance apart for planting by Mr. Atkinson, then an Assistant Collector. Mr. Atkinson's plot was half an acre in extent. I laid off a rectangle inside this so as to avoid the margin trees, and obtained a plot uniformly stocked with an

area of 0·42436 acre. A special interest attaches to the three Sample-areas A, B, and C of the *Tumalapenta* plantation, in that they are the only portions of the Government plantations in the Nellore District which are not overcrowded, and are at the same time sufficiently regular to afford an Acre-increment. Though the stock here is regular, and the figures obtained are undoubtedly good and trustworthy, yet the Sample-areas are small. Throughout this work in the Nellore District it has been a source of regret that there was not more wide planting to measure. With regard to close planting, as will appear in the course of this report, the figures obtained are as copious as could be desired. In the Nílgiri Eucalyptus and in the Mysore Casuarina tables a summary of the results obtained is entered at the head of each table of stock. In this report on the Coast Casuarinas the summary will be found transferred to the body of the report for facility of reference. The summary of the results obtained from the measurement of Sample-area A of the *Tumalapenta* plantation is accordingly entered here.

Summary of Table of Stock on the Sample-area, and of the Factor Table of A, Tumalapenta. Plantation, 5½ years of age, planted in 1877.

Sample-area 0·4244 acres, now carries 285 trees per acre.

—	DIMENSIONS OF TREES.			Form-factors.	
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.		
Maximum	27	46	11·02	0·65	Form-factor used 0·57.
Mean	18·69	43·74	5·16	0·57	
Minimum	9	24	0·61	0·50	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·93794	5·981

It almost invariably happens in a close plantation of trees of the same age that the Form-factor of the exceptionally tall trees which dominate the others is below the average; these trees run up to a point, and consequently have very high ideal cylinders, while their true cubic contents may not be much above the average. The Form-factor being the true cubic content divided by the Ideal-cylinder, it follows that the Form-factor of dominating trees is usually below the average of the trees around. Now a mean Form-factor may be taken, first, from the average of the Form-factor of each tree; second, in a general and more correct way by dividing the total of true cubic contents by the total of Ideal-cylinders. This second value for the average Form-factor is the most correct, since each tree then influences the general figure in proportion to its size. Thus the largest trees have the largest influence on the general average, and having themselves low Form-factors, the second value of a mean Form-factor is (exceptional circumstances apart) lower than the first value (on this subject, *vide* Nílgiri Eucalyptus Report). In Sample-area A of *Tumalapenta* it will be noticed that the first value, contrary to rule, is a very small fraction, 0·01 below the second value. I can detect no flaw in the figures, and account for this circumstance by the influence exercised by two trees of rather exceptional form—Nos. (8) and (10) on the small number of Factor trees taken here. Though of large size—in fact (10) has double the average cubic content—their height is not above the average, a result attributable probably to wind, Sample-area A being within 200 yards of the sea.

SAMPLE AREA B.

7. Sample-area B of the *Tumalapenta* plantation is similar to A in every respect, except that it is two years younger. There is one blank in A, the tree having been blown down in the last cyclone; there are three blanks in B. B was planted by

the Jungle Conservancy Department. A is rather above a foot apart, more sparsely planted than B, and it will be noticed afterwards that A gives better figures than B, both in the average dimensions of its trees and in its figures of growth.

The high maximum Form-factor is caused by one tree which had been broken by the wind.

Summary of Table of Stock on the Sample-area, and of the Factor Table of B, Tumalapenta. Plantation, 3½ years of age, planted in 1879.

Sample-area 0·4802 acres, now carries 383 trees per acre.

—	Dimensions of Trees.			Form-factors.	
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.		
Maximum	16	37	2·93	0·91	Form-factor used 0·67.
Mean	10·15	29·86	1·24	0·68	
Minimum	4	15	0·09	0·53	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·35370	3·052

SAMPLE AREA C OF TUMALAPENTA.

8. Sample-area C of *Tumalapenta* having the oldest and tallest trees in the plantation, it has suffered to a considerable extent from wind. Five trees altogether in the Sample-area have had their tops broken by the wind. No. 4 in the Factor table has a curious form expressed by the fraction 0·34; it is a tree broken at about the middle, but which afterwards made a long thin shoot from where it was broken off to nearly the average height of the trees around. With little head and a slender stem the Form-factor of this tree is the fraction which expresses a cone. The remaining nine trees show a regular form, the Form-factor varying only between 0·48 and 0·59. It may be estimated perhaps that wind has reduced the Acre-increment in Sample-area C by about one-half or one-third of a ton. C was planted by the Salt Department.

Summary of Table of Stock on the Sample-area, and of the Factor Table of C, Tumalapenta, Plantation, 9 years of age, planted in 1873 at 10½ feet × 10½ feet.

Sample-area 0·1739 acres, now carries 374 trees per acre.

—	Dimensions of Trees.			Form-factors.	
	Girth.	Height.	Cubic Content.		
Maximum	31	60	16·89	0·59	Form-factor used 0·53.
Mean	17·58	44·87	4·61	0·53	
Minimum	7	26	0·37	0·34	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·51196	4·514

SAMPLE AREA D OF TUMALAPENTA.

9. Sample-area D of Tumalapenta plantation was the first close planting measured. Unlike the rest of the planting of that year in the district, it was planted at one time. It shows consequently a regular growth, and was measured. The nine years old planting elsewhere, as has been already explained, is too irregular to measure for the Acre-increment. Like the rest of the close planting, D is planted $4\frac{1}{2}$ feet + $4\frac{1}{2}$ feet. Being on a poor soil, the ill-effects of such close planting are here most striking. The trees have a stunted appearance, and are small both in girth and in height. The margin trees are about treble the size of the interior trees, and of a healthy appearance and good shape. In both this Sample-area and the next E a thinning done six months ago has taken out half the stock, every intermediate tree having been cut. This severe thinning has covered the whip-like stems with clusters of small shoots in both D and E to a less extent in E than in D, E being two years younger, and thus having suffered less from overcrowding. The thinnings in both D and E are calculated in the usual form for the period at which they occurred. Probably in great measure owing to the covert, few of the trees cut six months ago have thrown up coppice shoots from their stumps. The stools with shoots were enumerated, the result being that 371 had thrown up coppice shoots out of 829 trees cut. There occurred in the Sample-area 103 blanks in the planting and 126 dominated trees under 3 inches in girth. Only two had apparently been broken by the wind.

Summary of Table of Stock on the Sample-area, and of the Factor Table of D, Tumalapenta. Plantation, 9 years of age, planted in 1873 at $4\frac{1}{2}$ feet × $4\frac{1}{2}$ feet.

Sample-area 1·00 acres, now carries 829 trees per acre; up to six months ago 1,658 trees per acre.

—	Dimensions of Trees.			Form-factors.	
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.		
Maximum	16	48	2·91	0·68	Form-factor used 0·52.
Mean	8·27	32·98	0·75	0·52	
Minimum	3	13	0·04	0·41	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·08536	3·058

SAMPLE AREA E OF TUMALAPENTA PLANTATION.

10. E, the next Sample-area measured, calls for no remark, it being similar to the preceding but two years younger. The covert and appearance of the grown are better than in the case of D, the trees having been overcrowded for a shorter time. It should be explained that the form given to the Sample-area in D, in E, and in the other masses of large close planting was a band running through the centre of the best stock on the ground. This band was uniformly 10 chains in length by 1 chain in breadth. It happened in E and in some other Sample-areas that it was found impossible to get a strip of even this moderate width without encountering wells. Where the presence of these wells caused any break in the canopy, the blanks in the canopy were estimated in the field and allowed for in the calculation. E having been cut over in the same manner and at the same time as D, the stools which had thrown up coppice shoots were enumerated. Out of 921 trees cut, 103 stools had thrown up coppice shoots. It should be mentioned that the trees felled were cut flush with the ground. Shoots from flush stools give the best coppice, but it appears that Casuarina coppices better if cut about 2 feet above the ground. There is a remarkably fine piece of coppiced Casuarina at the 36th and 37th mile-

stones of the Buckingham Canal. It is part of a large area owned by a Burman, and stretches north along the dunes beginning at the boundary of the Chingleput District. The trees are stated to have been cut when fifteen years of age, and the coppice shoots to be now four years of age. From the canal this plantation has the appearance of being composed of ordinary planted trees. In the plantation the stools are found furnished with tall clumps of coppice shoots, recalling the appearance of clumps of bamboos. In other places the superabundant shoots having been cut, the stool carries a fine tree between 30 and 40 feet high. The stools here were cut 2 feet above the ground, saws being used to guard against injury to the bark. On an average about half the stools are said to have furnished shoots, the casualties being on the higher drier portion of the dunes. There were in Sample-area E 18 blanks in the planting and 65 dominated trees below 3 inches in girth.

Summary of Table of Stock on the Sample-area, and of the Factor Table of E, Tumalapenta. Plantation, 7 years of age, planted in 1875 at 4½ feet × 4½ feet.

Sample-area 1·00 acres, now carries 921 trees per acre; up to six months ago 1,842 per acre.

——	Dimensions of Trees.			Form-factors.	
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.		
Maximum	14	41	2·55	0·77	Form-factor used 0·59.
Mean	7·49	28·78	0·60	0·60	
Minimum	3	10	0·03	0·42	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·08574	3·384

SAMPLE AREA F OF TUMALAPENTA PLANTATION.

11. In situation this is the same as the other two plots of close planting D and E. The appearance of the growth is as superior to E as E is to D; F being both planted farther apart and two years younger than E, it does not appear to have suffered much from overcrowding. It will be noticed that the Individual-increment is better than in E in spite of the trees being two years younger; the Acre-increment is less on account of the low age of F, only five years.

Summary of Table of Stock on the Sample-area, and of the Factor Table of F, Tumalapenta. Plantation, 5 years of age, planted in 1877 at 6 feet × 6 feet.

Sample-area 1·00 acres, now carries 1,066 trees per acre.

——	Dimensions of Trees.			Form-factors.	
	Girth.	Height.	Cubic Content.		
Maximum	12	37	1·62	0·76	Form-factor used 0·60.
Mean	7·46	27·22	0·54	0.60	
Minimum	3	14	0·04	0·37	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·10834	2·567

12. The plantations to the north of *Tumalapenta* being small, young, and of uncertain age, having been planted by the Salt Department, from *Tumalapenta* I proceeded south, visiting all the Government Casuarina plantations as far as the boundary of the Nellore District, north of Pulicat. Passing *Utakur* and *Varni* plantations, which have already been noticed, I arrived on the 9th February at the Kistnapatam plantation.

KISTNAPATAM PLANTATION.

13. This, the oldest Government plantation on the coast, is situated within a mile of the Nellore basin on the Buckingham Canal. It is a small plot of only 5 acres, originally planted by the Salt Department, and which, from the information furnished by the records of that department, is proved to be now nineteen years and four months old. Originally planted 30 × 30, and with now many gaps in the planting, these trees have from the beginning been entirely isolated the one from the other, most of them branch low; some are stag-headed and physically mature already. The subsoil moisture appears to be scanty, and the growth of the trees generally poor and irregular. Ten of the best were measured and gave an Individual-increment of 2·08857 cubic feet.

Summary of Table of Stock of the Kistnapatam Plantation, 19·3 years of age, planted in November 1863 at 30 feet × 30 feet.

Ten trees only measured.

—	Dimensions of Trees.			Form-factor used 0·55.
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.	
Maximum	52	78	52·96	
Mean	44·70	66·20	40·31	
Minimum	39	60	30·97	

Growth (yearly).

Individual-increment in Cubic Feet.

2·08857

14. From *Kistnapatam*, at the 91st milestone of the canal, I proceeded to *Taminapatnam* at the 87th milestone. This is a fine plantation, with trees of all ages, from nine years downwards, situated about a mile south of the mouth of the river which falls into the sea near the Nellore canal basin. It occupies a strip of flat sand lying immediately within the sand dunes. The dunes themselves are now being planted and fixed. In one place the drifting sand has invaded the plantation, burying the old Casuarina trees to a depth of 10 or 15 feet without apparently in any way injuring their growth. Two solitary Casuarinas, whose origin is unknown, growing entirely unprotected amongst the sand hills, about midway between the sea and the plantation, show a vigorous and suggestive growth. Within the *Taminapatnam* plantation the growth is superior to that in the *Tumalapenta* plantation, but less regular. The water in the wells here is at a depth of between 3 and 4 feet from the surface, while at *Tumalapenta* it was between 5 and 7. For the first 50 yards, just within the dunes, the growth is admirable; it then becomes patchy, and in the older planting there are large glades of from a quarter to one acre in extent, where the only trees remaining are those fringing the wells. In one of these glades I had pits sunk to a depth of from 3 to 5 feet, in order to investigate the cause of the death of the trees. These pits revealed nothing; the soil was the same, and the subsoil water at the same level

as outside the glade, where the Casuarina showed a good growth. The Wood Overseer attributed the death of these trees to the scorching effect of the land wind, a conclusion which I hesitate to adopt, but which is supported by the general shape of the glades, which are long, running east and west, and opening out landwards. I regret that the time at my disposal did not permit of deeper pits being sunk. In *Taminapatnam* two Sample-areas were taken, each an acre in extent, and sixty Factor trees in each Sample-area. I was unwilling here to break through the practice of taking Sample-areas an acre in extent, but there being nearly 2,000 trees to the acre, the stock tables were exceedingly long and laborious; in the next plantation measured, *Kottapatam*, it was found that time did not permit of taking Sample-areas larger than half an acre.

SAMPLE AREA A OF TAMINAPATNAM PLANTATION.

15. In *Taminapatnam* the two Sample-areas taken were—A, five years of age, and B, seven years of age. These were the only two years' planting that admitted of measurement. The planting nine years of age was spoilt by subsequent intermediate planting; that eight years of age was irregular in growth and broken into glades; there were a few fine trees only four years of age, but the growth was too irregular to furnish a Sample-area. The younger planting in this plantation is very creditable to the Jungle Conservancy Department, and being 9 feet × 9 feet, will in a few years be a valuable property. In A there were 99 blanks in the planting and 180 suppressed trees under 3 inches in girth. Of the 99 blanks, 21 were caused by wells.

Summary of Table of Stock on the Sample-area, and of the Factor Table of A, Taminapatnam. Plantation, 5 years of age, planted in 1877 at 4½ feet × 4½ feet.

Sample-area 1·00 acres, now carries 1,949 trees per acre.

—	Dimensions of Trees.			Form-factors.	
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.		
Maximum	22	53	8·64	0·78	Form-factor used 0·61.
Mean	6·63	31·30	0·58	0·61	
Minimum	3	10	0·04	0·44	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·11582	5·035

SAMPLE AREA B OF TAMINAPATNAM PLANTATION.

16. This, as has been already mentioned, is similar to A but two years older. While A is equal throughout to the Sample-area, less than half the area of B is equal to the fine growth through which the Sample-area was run; this fine growth extends for but a short distance inwards from the line of sand hills; elsewhere in B the growth is not above that which was measured in Sample-area E at *Tumalapenta*, or, in other words, the Acre-increment falls from 5 tons to 3 tons. That the trees in B were of exceptionally regular form will be noticed on running the eye down the 60 Form-factors shown in the Factor table. Here, as in the other Sample-areas, the Factor trees were selected from a row of trees running along the middle of the Sample-area from end to end, so that the trees, of which the forms are shown in the Factor table, represent the actual form occurring

throughout the length of the Sample-area. It will be noticed that the Factor trees often vary gradually: the higher Factors, the form more nearly approaching a cylinder, at one end of the table; the lower, those approaching a cone, at the other end. This is, of course, due to the differences in character of the stock, through which passes the Sample-area in the form of a long band. In B there were 214 blanks in the planting and 124 suppressed trees under 3 inches in girth. Of the 214 blanks, 33 were caused by wells.

Summary of Table of Stock on the Sample-area, and of the Factor Table of B, Taminapatnam. Plantation, 7 years of age, planted in 1875 at 4½ feet × 4½ feet.

Sample-area 1·00 acres, now carries 1,832 trees per acre.

—	Dimensions of Trees.			Form-factors.	
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.		
Maximum	24	62	8·78	0·79	Form-factor used 0·60.
Mean	7·90	35·24	0·91	0·61	
Minimum	3	5	0·04	0·51	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·13016	5·299

KOTTAPATAM PLANTATION.

17. From *Taminapatnam* I proceeded 10 miles south to the *Kottapatam* plantation, which is approached by a backwater turning off from the canal. *Kottapatam* is considered to show the best growth of any of the coast plantations; it was selected to be shown to the Duke of Buckingham on his journey up the canal. Taken as a whole, there is little difference in growth between the *Kottapatam* and the *Taminapatnam* plantations; the nine years old planting is equally irregular in both, but a portion of the eight years old planting in the former is without doubt the best that can be viewed in any of these close plantations. The Sample-area selected represents the best of this planting, and it will be observed that the figures obtained are higher than those of any other Sample-area in close planting, viz., an Individual-increment of 0·19 of a cubic foot and an Acre-increment of 6⅓ tons. Sample-area A is eight years of age; Sample-area B adjoins it, is a year younger, and shows a slightly inferior growth. The soil of both A and B is 4 or 5 feet of sand, then a bed of shell, and below this alluvial black clay and fine sand deposited by the backwater. It is doubtless to this mixed soil that the Casuarina owes its fine growth. The clay is at a depth where it is always moist, and it and the shells supply those mineral constituents which are absent in a purely silicious soil.

SAMPLE AREA A OF KOTTAPATAM.

18. The area of Sample-area A and of the next, B, is half an acre each, half an acre being taken instead of an acre on account of the high number of trees per acre in this close planting. But very little reduction was made in the number of the Factor trees, which were here 50 instead of 60 as in the one acre Sample-areas. In A there were 89 blanks in the planting and 138 suppressed trees below 3 inches in girth. Of the 89 blanks, 20 were caused by wells.

Summary of Table of Stock on the Sample-area, and of the Factor Table of Kottapatam, A Plantation, 8 years of age, planted in 1874 *at* $4\frac{1}{2}$ *feet* × $4\frac{1}{2}$ *feet.*

Sample-area 0·50 acre, now carries 1,520 trees per acre.

——	DIMENSIONS OF TREES.				
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.	Form-factors.	
Maximum	27	76	14·23	0·73 (0·65)	Form-factor used 0·57.
Mean	8·97	38·99	1·49	0·58	
Minimum	3	5	0·04	0·50	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·18631	6·293

SAMPLE AREA B OF KOTTAPATAM PLANTATION.

19. As in the preceding, Sample-area B represents the better portion of the stock in the seven years old planting; a considerable portion of the remaining stock is poor, and there are glades where the trees have died out entirely. As in the Taminpatnam plantation, the young planting at Kottapatam, 9 feet × 9 feet, is of excellent appearance. In B there were 101 blanks in the planting and 126 suppressed trees below 3 inches in girth.

Summary of Table of Stock on the Sample-area, and of the Factor Table of B, Kottapatam. Plantation, 7 years of age, planted in 1875 *at* $4\frac{1}{2}$ *feet* × $4\frac{1}{2}$ *feet.*

Sample-area 0·50 acre, now carries 1,542 trees per acre.

——	DIMENSIONS OF TREES.				
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.	Form-factors.	
Maximum	23	68	9·30	0·75	Form-factor used 0·57.
Mean	8·16	35·68	1·09	0·59	
Minimum	3	6	0·04	0·50	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·15588	5·342

SAMPLE AREA C OF KOTTAPATAM PLANTATION.

20. Within a few hundred yards of the *Kottapatam* plantation, on the landward side of the dunes, with a perpetual spring of fresh water on one side, is a clump of generally well-grown Casuarina trees, planted by some fishermen ten years ago round their village. The village was deserted during the famine, and now only the trees remain. I found on inspection that these trees were too irregularly placed to be put into a Sample-area, and were therefore simply measured for their Individual-increment. Ten out of the number were felled and the Form-factor determined. Curiously, this proved to be almost the same as the Form-factor from

the two Sample-areas in the close planting; all three worked out to an average of ·57. I have found it on other occasions difficult to estimate the Form-factor of margin trees. Ordinarily, it would be expected that a margin tree would have a form between the cylindrical shape of the closely-grown pole and the conical shape of the tapering isolated tree. Often, however, margin trees have a pole-like stem, and develop an ample head afterwards when they have quite shaken themselves free of the trees on one side. The combination of a cylindrical stem and an ample branching head gives, of course, a very high Form-factor. In appearance these well-developed trees on the old village-site are a great contrast to the poles of the close planting. Comparing Individual-increments it will be seen that the average growth of the trees in C is exactly ten times that of the average growth of the close planting by its side in Sample-area B, and B, it will be borne in mind, is far above the general average of the close planting. B has, in fact, given the second best figures of growth of all the Sample-areas in the closely-planted plantations. As will be noticed, the same ratio exists comparing the Acre-increments of sparse planting at 200 to the acre and of dense planting 2,000 to the acre; good planting of both kinds will yield the same Acre-increment of 5 tons, so that ten trees in the dense planting do no more work than one tree in the sparse planting. Near these Casuarinas on the old village-site I counted eight or ten self-sown Casuarina seedlings, suggestive of natural forest of Casuarina; but the locality is rather exceptionally favorable, with the loose sand of the dunes and a spring of fresh water 2 feet below the surface.

Summary of Table of Stock on the Sample-area, and of the Factor Table of Kottapatam, C Plantation, 10 years of age, planted in 1872 irregularly round some fishermen's huts.

—	Dimensions of Trees.			Form-factors.	Form-factor used 0·57.
	Girth.	Height.	Cubic Content.		
Maximum	43	70	34·45	0·63	
Mean	28·48	59·96	15·56	0·57	
Minimum	20	45	5·92	0·51	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
1·55549	...

DUGARAZPATNAM PLANTATIONS.

21. From *Kottapatam* I proceeded south to *Dugarázpatnam*, at the 69th mile-stone of the canal. There is here a large plantation of dense planting skirting the backwater. On the whole this planting is inferior to much that I had seen and already measured, nor did it appear that there was anything further to be learnt by taking more measurements of dense planting. The usual remarkable difference in dense planting between inner trees and margin trees seemed accentuated here. In the lower portion of the Government planting at *Dugarázpatnam*, whether owing to flooding by salt water or a saline soil, the growth is poor and glades are numerous.

DUGARAZPATNAM A.

22. This was a small piece of private planting on wet assessed land, carefully manured and tended; the figures shown below are approximate only on account of the few trees measured and the possibility that the information given of the age of the planting may not be quite accurate, but the growth was very regular, and it is probable that had a whole acre been measured the figures would have varied but

little from these. They show what growth may be expected with abundant manure and water at even such an early age as three years :—

Summary of Table of Stock on the Sample-area, and of the Factor Table of Dugarázpatnam. A Plantation, 3 years of age, planted in 1879 at 6 feet × 6 feet.

Sample-area 0·0322 acres, now carries 1,180 trees per acre.

—	Dimensions of Trees.			
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.	
Maximum	13	36	2·02	Form-factor used 0·60.
Mean	7·66	28·50	0·62	
Minimum	3	12	0·04	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
0·20789	5·452

DUGARAZPATNAM ISOLATED TREES.

23. Going south, *Dugarázpatnam* is the last of the Government plantations; it remained then but to measure some large trees planted in a row by the side of the canal. These trees are in a prominent position, and their age was known to the Wood Overseer and to people on the spot. The trees lower down the canal were remembered to be twenty years of age from the fact that they were planted when the first kandam on the *Sríharikót* Island was cut. The trees termed *Dugarázpatnam* B extend for about a mile along the canal bank; some of them appeared to be on bad soil and showed but a poor growth. Of 189 trees measured, 11 were stag-headed, and the gaps in the original row of trees represented almost as many trees as are now there. Good and bad were measured together with the following results :—

Summary of Table of Stock of the Dugarázpatnam B (Canal) trees, 20 years of age, planted in 1862 at 15 feet apart in one row.

—	Dimensions of Trees.			
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.	
Maximum	71	85	91·99	Form-factor used 0·50.
Mean	38·01	48·74	23·68	
Minimum	20	30	5·53	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
18,406	...

SRIHARIKOT ISOLATED TREES.

24. Fifteen miles further south, near the kasba village of the island of *Sríharikót*, were some Casuarina trees growing in a broken row by the side of the canal and of the Pulicat lake. They were planted by Mr. Fraser, the Engineer of

the canal. Of the same age as the preceding, they showed a far better growth. These trees are growing close to the edge of the salt water on a rich mixed alluvial soil—that of the *Sríharikót* Island. The Individual-increment which they have yielded, approaching 4 cubic feet, is a figure which will be noticed and compared with others in considering below the figures of growth which have been obtained. Some of these trees are of very remarkable size. The tree with the maximum cubic content in the statement below is 74 inches in girth and 97 feet in height. It cubes 146·77 cubic feet = 3·262 tons, and has an Individual-increment of 7·34 cubic feet. The highest Individual-increment from a Nílgiri Blue-gum on record is 12 cubic feet, which also is from a tree grown isolated :—

Summary of Table of Stock of the Sriharikót Canal trees, 20 years of age, planted in 1862 at 15 feet apart in one row.

—	Dimensions of Trees.			
	Girth in Inches.	Height in Feet.	Cubic Content in Cubic Feet.	Form-factor used 0·50.
Maximum	76	99	146·77	
Mean	56·90	77·85	71·95	
Minimum	44	57	36 38	

Growth (yearly).

Individual-increment in Cubic Feet.	Acre-increment in Tons (dry wood with bark).
3·600	...

FIGURES OF GROWTH.

ACRE-INCREMENT.

25. The following form, used in the Nílgiri Eucalypt Report and in the Mysore Casuarina Report, exhibits the various figures of growth brought together on one sheet. Of eight Sample-areas of close planting measured, the highest Acre-increment obtained was that yielded by the piece of show planting at *Kottapatam* plantation, viz., 6·29 tons; the lowest, that yielded by the young planting at *Tumalapenta*, viz., 2·567 tons. The average of the eight Sample-areas of close planting is 4·554 tons. These Sample-areas are samples of the best and most complete stock in each plantation. The average yield for close planting may be taken as not exceeding 3 tons per acre per annum. The Sample-areas of D, E, and F of *Tumalapenta* very fairly represent the average growth, and the average Acre-increment of these three Sample-areas is exactly 3 tons.

The three Sample-areas of wide planting, viz., A, B, and C of *Tumalapenta* are, in fact, all the regular wide Government planting in the Nellore District, and the average of these three areas, viz., 4·515 tons, must be reckoned as below the average growth, since there was no selection in these areas, and the growth in the *Tumalapenta* plantation, though regular, is the poorest of the plantations measured. The average of the three Sample-areas of close planting at *Tumalapenta* is as much as 2·481 tons below the average of the close planting in the Sample-areas of other plantations, which is 5·484 tons. Thus, for wide planting 4½ tons may be taken as the average Acre-increment for poor growth on the dunes and about 7 tons on better soil.

TABLE OF ACRE-INCREMENTS.

Showing the Growth of Casuarina on the Coast.

Plantations.	Area of Plantations in Acres.	Age of Sample-area in Years.	Elevation in Feet.	Area of Sample-area in Acres.	Number of Trees per Acre now on the ground.	Form-factor used.	Actual Stock now on the ground per Acre. Cubic Feet.	Yearly Individual-increment (actual). Cubic Feet.	Yearly Acre-increment (calculated tons of dry wood).	Details of Acre-increment. Standing Stock.	Details of Acre-increment. Blanks in Canopy.	Details of Acre-increment. Previous Thinnings.		Remarks.
Tumalapenta A	53	5½	7·0	0·4244	285	0·57	1469·98	0·93794	5·981	5·940	0·041	..	Sparse planting.	Sparse planting in three small plots which were measured *in toto.*
Do. B		3½	..	0·4802	283	0·67	474·52	0·36370	3·052	3·013	0·039	..		
Do. C		9	..	0·1739	374	0·53	1722·25	0·51196	4·514	4·252	0·262	..		
Do. D		9	..	1·00	(a) 829	0·52	636·91	0·08536	3·058	1·573	..	1·485	Dense planting.	(a) Half the stock cut out six months ago, planted 4½ feet × 4½ feet. (b) Planted 6 feet × 6 feet.
Do. E		7	..	1·00	(a) 921	0·59	552·78	0·08574	3·384	1·755	..	1·629		
Do. F		5	..	1·00	(b) 1,066	0·60	577·47	0·10834	2·567	2·567	..	..		
Taminapatnam A	390	5	5·0	1·00	1,949	0·61	1128·74	0·11582	5·035	5·017	0·018	..		Planted 4½ feet × 4½ feet.
Do. B		7	..	1·00	1,832	0·60	1169·2	0·13016	5·299	5·299	..	..		
Kottapatam A	290	8	6·0	0·50	1,520	0·57	2265·60	0·18631	6·293	6·293	..	..		
Do. B		7	..	0·50	1,542	0·57	1682 60	0·15588	5·342	5·342	..	..		
Dugarázpatnam A	4	3	5·0	(c) 0·0322	1,180	0·60	736·02	0·20789	5·452	5·452	..	..		(c) The figures relating to this Sample-area are approximate only.
Kottapatam C	1	10	..	..	..	0·57	..	1·55549	..	..	..	..	Isolated planting.	Margin trees.
Kistnapatam	5	17	12·0	0·0	..	0·55	..	2·8700	..	..	..	..		
Dugarázpatnam B	..	20	5·0	..	..	0·50	..	1·18406	..	..	..	..		Isolated trees.
Srïharikót	..	20	5·0	..	..	0·50	..	3·6000	..	..	..	..		

For close planting the above figures may be considered to be as complete as there is any object in making them, they being averages taken from the measurement of 8,166 trees and of 6·0322 acres. For wide planting more measurements are necessary. The 5 Acre-increments from the Mysore Casuarina plantations all relate to very wide planting done 15 × 15, in which, strictly speaking, some allowance should be made for the first six or eight years, or until the trees close. This would raise the best Mysore Casuarina Acre-increment to 7 or 8 tons, and theoretically I see no reason why this Acre-increment should not be realized in the case of Casuarina planted on good soil with abundant subsoil moisture and spaced 12 × 12, either on the Mysore plateau or the Madras Coast. Within the limits of my experience the growth of Casuarina does not perceptibly vary for elevations up to 3,000 feet. There are a few well-grown Casuarinas on the Nundydroog Hill near Bangalore at an elevation of 4,600 feet, but the growth at that elevation is observably less than at the plateau level, which is there 3,000 feet above the sea. In West Mysore the tree flourishes in a few situations, where it has been planted up to a rainfall of 40 inches. Beyond this, on coffee estates the growth is not good; but I believe Mr. Dickinson is planting Casuarina successfully at 4,000 feet and in the heavy rainfall of Mercara in Coorg. The lower the elevation, the more severe must be the transpiration from an ever-green and a rapid grower, such as Casuarina. On the deep red loams of the Mysore plateau, where the level of well water is 30 or 50 feet below the surface, Casuarina exhibits a growth nearly equal to that on the mixed alluvial soils of the Madras seaboard (the Sríharikót Island for example) and superior to the average of growth on the sand dunes of the coast. With moderate subsoil moisture in Mysore, as in Sample-areas A of Kadgodi and Nelal plantations (*vide* Mysore report on rate of growth of Casuarina) the growth is equal to the best Coast Casuarina. Generally the Mysore Casuarina plantations are on bare or scrub covered plains, where the subsoil moisture in the dry season is at a great depth, and it is a remarkable fact that in the terrible droughts of 1876 and 1877 the casualties amongst these trees were practically nil.

The ages of the Government Casuarina plantations in the Nellore District are too low to admit of deducing from the Acre-increments, which is the most profitable age at which to fell Casuarina; and the unskilful treatment these p'antations have received would render a maximum Acre-increment impossible, whatever the age at which the growths were examined.

A measurement of 110 trees in a private plantation south of Madras made by Mr. Lushington under Dr. Brandis' direction yielded an Acre-increment of 3½ tons at thirteen years of age. The following figures were furnished by Mr. Wooldridge, Deputy Conservator, to Dr. Brandis, and handed over by the latter to me when I was placed on special duty measuring the figures of growth of Casuarina. It will be observed that I calculate an Acre-increment of 4·518 tons at eight years from Mr. Wooldridge's figures. Judging from the description given of the plantation, a like result would have been produced by a "cubage" or measurement of standing stock. If figures such as those furnished by Mr. Wooldridge were recorded systematically for large areas, and over a term of years, the data would be valuable, especially in the case of Casuarina, which has a regular growth, is usually cropped early, felled nearly clean, and sold on the spot by weight. Otherwise, and notably in the case of any special inquiry, it is less tedious and more accurate, even in the case of the youngest trees, to measure the stock standing than to fell and weigh it.

INDIVIDUAL-INCREMENTS.

26. In planting such as that in Nellore, which has been maintained at the rate of 2,000 trees to the acre, the Individual-increments are so small that they may be passed over, with the observation that the poorest is 0·085 cubic feet in D and E of the *Tumalapenta* plantation, and the best 0·186 cubic feet in the show planting at A of the *Kottapatam* plantation.

In the three Sample-areas of wide planting at *Tumalapenta* it will be observed, and the fact is significant, that the Individual-increment varies exactly with the sparseness of the planting in spite, too, of the difference of ages, in two cases. A calculation of the approximate yield of the Shonangcupam Casuarina plantation on

the sea-coast, near Cuddalore, south of Madras. Soil, a fine sand 8—12 feet deep, thin clay, with occasional beds of shells. Fresh water at 6 feet below the surface in the hot weather.

The plantation was planted in 1873, pruned during the first four years, and a few poles thinned out during the fourth year. It was thinned again during the sixth and seventh years, and cut over finally when eight years of age, leaving on foot 220 standards (=10 per acre), estimated to contain 23 tons.

THINNINGS.

Date of Felling.	Number and Sort of Trees felled.	Age when felled.	Sort of Wood obtained.	Quantity. T.	Cwts.	Lb.	Amount realized by Sales. Rs.	A.	P.	Amount in Tons increased by Interest at 4 per cent. (Compound Interest) till the period of the Final Cutting.
1874	6,000 saplings pruned.	1	Twigs and brush-wood	1	0	0	59	0	0	1·316
1875	2,321 casualties ripped out	2	Faggot wood ..	6	0	0				7·590
1876	860 do. do. ..	3	Do.	5	0	0				6·085
1877 ..	10,000 pruned	4	Do. and twigs.	4	0	0				4·680
	500 selected poles ..	4	Loppings	3	0	0				3·510
			Timber	28	0	0	125	0	0	32·760
August 1879 ..	1,710 selected	6	Billets and faggot wood	78	2	0	292	14	0	84·404
December 1880 ..	3,187 do.	7	Billets 13,445 ..	100	0	0	400	0	0	104·000
			383 head-loads of loppings	8	11	0	12	5	0	8·890
			Ends rejected as billets, 5,038 pieces ..	11	3	0	45	13	11	11·596
				244	16	0	935	0	11	264·831

FINAL CUTTING.

Area felled in Acres.	Date of Felling.	Number and Sort of Trees felled.	Age of Wood when felled.	Sort and Quantity of Wood obtained.	Amount realized by Sales. Rs.	A.	P.	Tonnage.
$22\frac{3}{10}$. There were 220 trees left as standards, estimated to contain 23 tons, at date of clean felling and a fair coppice growth still on hand.	From November 1881 to February 1882.	8,860 seedlings planted in 1873, viz., 3,036 under 1 foot in girth at 5 feet high and 5,824 trees over 1 foot girth.	7	67 poles sold at 5 annas the cubic foot ..	71	2	1	5
				Firewood in billets, 46,226 ..	1,471	0	0	490·25
				Loppings and heads of trees .	80	0	0	23
				Side roots ..	7	0	0	2
		4,658 coppice shoots from 943 roots of 1865 planting.	8	Firewood in billets ..	819	0	0	273
				Loppings, &c...	45	0	0	15
					2,193	2	1	808·25

Calculation of Acre-increment.

		TONS.
Thinnings	=	264·831
Final cutting	=	808·250
Standards left on the ground	=	23·000
Total stock on 22·3 acres	=	1096·081
Stock per acre = 1096·081 ÷ 22·3	=	49·151
Increment per acre per annum $\frac{49 \cdot 151}{8}$	=	6·144

This refers to wood about one month seasoned; to convert to tons of dry wood $6 \cdot 144 \times \frac{50}{68}$* $= 4 \cdot 518$ tons of dry wood.

* Wood, green with bark, being 70 lb. per cubic foot, and Coast Casuarina, dry with bark, 50 lb. per cubic foot.

A, with the highest Individual-increment, is half the age of B with the next highest figure. It hardly needs remark that while Acre-increments rise slowly, remain at a maximum and decline slowly, Individual-increments should rise rapidly during the whole period of a tree's growth up to the period of its physical maturity, when the foliage becomes scanty and the crown stag-headed.

Amongst the margin and isolated trees are some good Individual-increments. The row of trees planted by the side of the Buckingham Canal a few miles below Dugarázpatnam have an increment of a little more than a cubic foot at twenty years of age. The trees classed as margin trees, planted by the fishermen on the dunes around their village, exhibit a good figure of growth in an Individual-increment of a foot and-a-half at ten years of age. The next on the list is 2·37 cubic feet from the isolated trees in the old Casuarina plantation at *Kistnapatam*. Lastly, the giants on the *Sriharikót* Island, with the remarkably high Individual-increment of 3·6 cubic feet of average growth at twenty years of age. Amongst the Nílgiri Eucalypts the highest Individual-increment obtained was 4·3 cubic feet from Blue-gum standards over wattle coppice, no purely isolated Blue-gums having been measured. Over $3\frac{1}{2}$ cubic feet for the Individual-increment of Casuarina is undoubtedly a surprising figure, and shows the decided preference of the tree for ample space and room to develop. Casuarina should be planted sparse, and in the after-thinnings it should ever be borne in mind that the nearer the tree is kept *almost isolated*, the better will be the two figures of growth—the Acre-increment and the Individual-increment. The Nílgiri figures presented the same conclusion for the Blue-gum, while to a moderate extent the reverse appeared to be true for the shade-bearing *Acacia melanoxylon*.

FORM-FACTORS.

27. This part of the Nellore work will be found to be exceptionally strong. In the Mysore Casuarina work the proportion of Factor trees to trees measured was greater than in the Nílgiri work, as it appeared from the first that the Casuarina Form-factors were not likely to prove as regular as had been the Blue-gum Form-factors. The Blue-gum tree grown in close plantations presents the curious feature of having a Form-factor only 0·02 higher at five years of age than at twenty years of age. Practically the Form-factor for close plantations of Blue-gum from five to twenty years of age is 0·45. At five years of age the blue-gum is already a small tree, while the Casuarina (unpruned) takes the form of a bush. Bushes have high Form-factors. Pruning by cutting off the lower branches, or natural pruning by close planting, gives Casuarina a more tree-like and conical form, lowering the Form-factor. The Form-factors for Casuarina obtained in the Mysore work showed a decline from as high as 0·72 for young bushy trees to 0·53 for trees eleven years of age planted 15 × 15. The same progression may be noticed in the Nellore Casuarina Form-factors, but to a less marked degree, the trees being reduced by crowding to a form approaching a cylindrical pole crowned by a scanty head of leaves. Thus, in the dense planting at *Tumalapenta* we have 0·60, 0·59, and 0·52 at the ages of five, seven, and nine years. In the dense planting at *Tuminapatnam* 0·61 at five years, 0·60 at seven years. In the dense planting at *Kottapatam* 0·57278 at seven years and 0·56667 at eight years. With the exception of *Tumalapenta* D, which at nine years has the abnormally low factor 0·52, these results exhibit a satisfactory uniformity, a uniformity due, no doubt, to the general regularity of growth in these plantations and the large number of measured trees on which the figures are founded. The exception in *Tumalapenta* D is explainable from the fact of those trees having suffered to the extent that their crowns are almost destroyed by overcrowding; the ill-appearance of these trees is noticed in the description of that portion of the plantation. Leaving aside these abnormal trees, we have the following average Form-factors for different ages in close planting at $4\frac{1}{2} \times 4\frac{1}{2}$:—

At five years of age the Form-factor is $\frac{0·60185 + 0·60690}{2}$ = 0·60437

At six years (interpolating) the Form-factor is ... = 0·59598

At seven years of age the Form-factor is $\frac{0·5931 + 0·5969 + 0·57278}{3}$ = 0·58759

At eight years of age the Form-factor from one Sample-area is ... ... = 0·5667

At nine years of age the Form-factor may be assumed at about ... ... = 0·545

After this age, unless the trees were thinned, they would begin to lose their crowns as has happened at *Tumalapenta* D, where the Form-factor has sunk to 0·5231.

In the sparse planting the Form-factors stand thus :—

At $3\frac{1}{2}$ years of age	0·67
At $5\frac{1}{2}$ „ „	0·57
At 9 „ „	0·53

Thus, as Casuarina trees grow older, provided they have room to develop, the Form-factor becomes less. In exceptional cases the fall is very rapid, thus in very wide, or in isolated planting on poor soil, a low bushy form gives Form-factors as high as 0·72 and above 1·0 in extreme cases; at fifteen or twenty years of age the trunk of isolated Casuarinas becoming very tapering and the crown very scanty, the Form-factor sinks to 0·45, 0·50, or perhaps lower, but measurements of old isolated trees are required in order to determine this point accurately. In very close planting ($4\frac{1}{2} \times 4\frac{1}{2}$) the Form-factor falls less rapidly than in wide planting, but in extreme cases, where the close planting has destroyed or much reduced the heads of the trees, we have seen that the Form-factor may fall to 0·52. Planting 12 feet × 12 feet and thinning afterwards, so as to maintain the trees moderately close, would probably yield Form-factors falling gradually from 0·65 at five years of age to ·55 at fifteen or twenty years of age. Planting 15 × 15 the Form-factor would be slightly higher at first, and depends afterwards on the thinning. Of the isolated trees measured, only those at *Kottapatam* C could conveniently be felled to determine the Form-factor. These gave an unexpectedly high figure, but they belong to the class of tree-form which is usually found on the margin of plantations. If isolated on both sides, their Form-factor would doubtless have proved lower.

AVERAGE DIMENSIONS OF THE TREES MEASURED.

28. The following statement shows the average dimensions of the trees measured brought together on one sheet. Ordinarily, in studying the growth of plantations, the average height at different ages is an important figure which has to be considered; but in the case of Casuarina, which practically is grown exclusively for firewood, the average height of the stock is quite subordinate to the gross yield of wood per acre. Height confers the small advantage in a Casuarina plantation of a lessened diameter for equal bulks of wood, and consequently a greater facility for sawing up into firewood billets.

In tabulating and comparing the figures obtained from the Nílgiri Blue-gums a most unexpected result became apparent, viz., that, comparing the dense (6 × 6) and the sparse (9 × 9) planting in the Eucalyptus plantations, not only was the Acre-increment better in the sparse planting and the Individual-increment incomparably so, but the *average height of the trees in the sparse planting proved greater than the average heights in the dense planting.* Whichever planting might yield the best growth in bulk of wood, it was naturally expected that the denser planting would have the taller trees, but the reverse proved to be the case. Casuarina, the fast-growing fuel tree of the plains, and elevations up to 5,000 feet, behaves exactly like the Blue-gum, the fast-growing fuel tree of the hill above 5,000 feet. Casuarina is an exceedingly fast grower; the Blue-gum on the Nílgiris, incredible as it may seem, makes wood at about double the rate of Casuarina. But their wonderful rates of growth are only realized on the condition that both trees have ample light and space—a requirement which is more marked in the case of the Casuarina than of the Blue-gum. Planted in very light shade, both Casuarina and Blue-gum cease to grow; planted dense in close plantations, the trees lose not only in girth, but also in height, this loss of height being more marked in the Casuarina than in the Blue-gum. Glancing down the column of average heights for the Nellore Casuarinas, it will be perceived at once how height is lost as density of planting increases. In the *Tumalapenta* plantation are two Sample-areas, C and D, on the same soil, side by side, touching one another. Each area is nine years old, and has received exactly the same treatment. The average height of the trees in C is now 44·86 feet, of those in D 32·98; C has 374 trees to the acre and D had 1,658 trees up to six months ago. In Kottapatam C, which is only a year older, and where the trees are

nearly isolated, the average height is 59·96 feet. Again, Tumalapenta A, which is five-and-a-half years old, may be compared to Tumalapenta F, which is five years old, the average heights being 43·74 and 27·22, respectively, A being sparse and F dense planting. In Taminapatnam plantation the growth is better than in the Tumalapenta plantation, but this is far from bringing the heights of Tumalapenta A and Taminapatnam A to even an equality; in Tumalapenta A, planted 285 trees to the acre, the average height is 43·74; in Taminapatnam A, planted 1,944 trees to the acre, the average height is 31·30. In Tumalapenta B, with 383 trees to the acre, the average height of the trees is about equal to Dugarázpatnam A, the latter being a small piece of private planting on manured wet land, while Tumalapenta is the plantation of the poorest growth of any measured. Kottapatam A, the shore close planting, has an average height of 38·99 feet at eight years of age. The comparatively poor Tumalapenta plantation at nine years of age has nevertheless in the sparse planting an average height of 44·86 feet.

Average Dimensions of the Trees in the Plantations measured.

Plantations.	Age in Years.	Girth at 5 Feet in Inches.	Height of Tree in Feet.	Cubic Contents in Cubic Feet.		Remarks.
Tumalapenta A	5·5	18·69	43·74	5·16	Sparse planting.	Here A and C are of nearly equal average dimensions, although C is nearly double the age of A, the reason being chiefly that A is planted 285 trees per acre, while C is 374 trees per acre.
Do. B	3·5	10·15	29·86	1·24		
Do. C	9·	17·58	44·86	4·514		
Tumalapenta D	9·	8·27	32·98	0·75	Dense planting.	Planted 4½ × 4½
Do. E	7·	7·49	28·78	0·60		Do. 4½ × 4½
Do. F	5·	7·46	27·22	0·54		Do. 6 × 6
Taminapatnam A	5·	6·63	31·30	0·58		Do. 4½ × 4½
Do. B	7·	7·90	35·24	0·91		Do. 4½ × 4½
Kottapatam A	8·	8·97	38·99	1·49		Do. 4½ × 4½
Do. B	7·	8·16	35·68	1·09		Do. 4½ × 4½
Dugarázpatnam A	3·	7·66	28·50	0·62		Do. 4½ × 4½
Kottapatam C	10·	28·48	59·96	15·56	Isolated trees.	Planted in scattered groups.
Kistnapatam	17·	44·70	66·20	40·31		In a plantation with scattered trees.
Dugarázpatnam B	20·	38·01	48·74	23·68		In a row by the Buckingham Canal.
Sriharikót	20·	56·90	77·85	71·95		Do. do.

SPECIFIC GRAVITY OF COAST CASUARINA.

29. In continuation of the concluding remarks of my note on the growth of Casuarina in Mysore, it will be observed from the table of experimental weighings of Coast Casuarina that the latter is slightly lighter than Mysore wood. In Mysore the weight of green branch-wood with bark was determined to be 72 lb. per cubic foot; of seasoned branch wood with bark to be 52 lb. per cubic foot; for branch and trunk-wood together 54 to 56 lb. per cubic foot. For Coast Casuarina the mean of 20 pieces measured and weighed at the Tumalapenta plantation is 69·03 lb. per cubic foot for green wood with bark. Probably on an average soil composed less exclusively of pure sand the weight would be slightly heavier; 70 lb. per cubic foot is the figure adopted in the calculations, after the figures referring to the first plantation in which the Mysore value of 72 lb. per cubic foot was employed. In converting the cubic feet of the Acre-increment into tons of dry wood, the value of 45 cubic feet per ton was used. This equals 49·7 lb. per cubic foot. In the weighings of seasoned branch-wood with bark at Dugarázpatnam 45·04 is the mean value obtained, but this value, it will be observed, refers exclusively to wood of small diameter seasoned as much as three years. Ordinarily, there is no doubt that the value of seasoned Casuarina wood with bark, branch-wood and trunk-wood together, is not below 50 lb. per cubic foot. To recapitulate, the values obtained for the specific gravity of Casuarina wood stands thus:—

Green Branch-wood with Bark.

Mysore Wood per Cubic Foot.	Coast Wood per Cubic Foot.
72 lb.	70 lb.

Green trunk-wood with bark may be slightly heavier, but this figure is not required when the trunks are measured as in the case of "cubage."

One year seasoned Branch-wood and Trunk-wood with Bark.

Mysore Wood.	Coast Wood.
55 lb. (branch-wood alone being 52 lb.)	50 lb. (branch-wood alone being about 48 lb.)

Experimental Weighing of Billets of Casuarina Wood, green and with bark, from Tumalapenta Plantation. Wood grown on loose sand within a hundred yards of the sea.

	Number of Trees.	Mean Girth in Inches.	Length in Feet.	Cubic Content in Feet.	Weight of Billet in Pounds.	Weight per Cubic Foot in Pounds.
	1	8·75	10	0·42	29·0	69·05
	2	6·25	10	0·22	15·5	70·45
	3	7·50	9	0·28	20·5	73·21
	4	9·25	9	0·42	32·0	76·19
	5	8·50	8	0·31	23·0	74·19
	6	6·25	8	0·17	10·5	61·77
	7	12 25	8	0 66	50·0	75·76
	8	10·0	8	0 44	32·0	72·73
	9	6 75	7	0·17	10·5	61·77
	10	7·25	7	0·20	12·5	62·50
	11	6·50	7	0·16	10·5	65·63
	12	6·0	7	0·13	9·5	73·08
	13	9·25	6	0·28	18·0	64·29
	14	8·50	6	0·24	17·0	70·83
	15	8·0	5	0·17	11·5	67·65
	16	7·25	5	0 14	10·5	75·00
	17	7·25	4	0·11	8·0	72·72
	18	8·0	4	0·14	8·5	60·71
	19	10·25	3	0·17	12·0	70·59
	20	9·75	3	0·16	10·0	62 50
Sum ...	...	163·50	134	4·99	351·0	1380·62
Mean ...	...	8·17	6·7	0·25	17·55	69·03

Weighings for Specific Gravity of Coast Casuarina three years seasoned and with Bark.

Number of Piece.	Mean Girth.	Sectional Area in Feet.	Length of Piece.	Cubic Content.	Weight in lb.	Weight per Cubic Foot.	REMARKS.
1	6·75	0·0255	14	0·36	16·00	44·44	These pieces of wood were carefully examined previous to being measured and weighed; all which showed signs of being bored by insects or of the slightest decay were rejected The wood was obtained from an old grass hut pulled down for the purpose at Dugarázpatnam.
2	11·58	0·0744	10	0·74	34·50	46·62	
3	11·50	0·0731	8	0·58	27·00	46·55	
4	11·83	0·0769	8	0·62	30·00	48·39	
5	7·92	0·0345	10	0·35	15·50	44 29	
6	8·75	0·0423	13	0·55	24·00	43·64	
7	7·00	0·0271	15	0·41	18·00	43·90	
8	7·67	0·0323	12	0·39	18·00	46·15	
9	7·08	0·0279	10	0·28	12·50	44·64	
10	6·17	0·0209	12	0·25	11·00	44·00	
11	6·25	0·0216	9	0·19	8·50	44·74	
12	6·33	0·0223	11	0·25	11·50	46·00	
13	6·08	0·0206	10	0·21	9·25	44·05	
14	6·75	0·0252	13	0·33	17·00	51·52	
15	5·17	0·0147	11	0·16	6·50	40·63	
16	7·50	0·0311	7	0·22	9 30	42·27	
17	6·25	0·0216	10	0·22	10·50	47·73	
18	7·17	0·0283	7	0·20	8·25	41·25	
19	5·92	0·0192	11	0·21	9·50	45·24	
20	7·42	0·0303	8	0 24	10·75	44·79	
Sum..	151·09	0·6698	209	6·76	307·55	900·84	
Average..	7·55	0·0335	10·45	0·34	15·38	45·04	

THICKNESS OF BARK.

The following statement shows the average thickness of Casuarina bark, or thickness which is included in all the girths shown in these tables, and which it is

therefore useful to record. The average thickness of Casuarina bark is less than that of Blue-gum bark, and these figures have interest, taking the comparison between them and the similar figures given in the Nílgiri report for the Blue-gum tree and for another Eucalypt, the Stringy-bark tree. As with the Eucalypts, the thickness of bark increases directly with the girth, and consequently indirectly with the age and growth of the trees :—

KOTTAPATAM PLANTATION.

Averages of Thickness of Bark.

Plantations.	Number of Tree.	Age.	Average Girth.	Mean Thickness of Bark on the Trunk at 5 feet from the ground.	Mean Thickness of Bark on the Branch-wood.	Remarks.
			INCHES.			
Kottapatam A	1	Eight years of age.	9	0·094	0·031	Dense planting.
	2		15	0·156	0·047	
	3		7	0·062	0·016	
	4		12	0·109	0·047	
	5		10	0·094	0·031	
	6		11	0·094	0·047	
	7		9	0·094	0·031	
	8		12	0·094	0·031	
	9		8	0·078	0·031	
	10		11	0·078	0·047	
Sum ..	..	..	104	0·953	0·359	
Average ..	..	..	10·4	·0953	·0359	
Kottapatam B	1	Seven years of age.	11	0·109	0·047	Dense planting.
	2		9	0·062	0·031	
	3		11	0·079	0·031	
	4		9	0·109	0·031	
	5		8	0·062	0·031	
	6		7	0·062	0·016	
	7		8	0·062	0·016	
	8		11	0·062	0·031	
	9		8	0·079	0·037	
	10		11	0·093	0·047	
Sum ..	..	..	93	0·779	0·318	
Average ..	..	..	9·3	·0779	·0318	
Kottapatam C	1	Ten years of age.	33	0·281	0·125	Sparse planting: thes measurements refer to margin trees.
	2		26	0·125	0·062	
	3		25	0·125	0·109	
	4		29	0·187	0·125	
	5		36	0·266	0·125	
	6		21	0·125	0·062	
	7		19	0·094	0·062	
	8		25	0·25	0·078	
	9		20	0·125	0·078	
	10		23	0·187	0·031	
Sum ..	..	..	257	1·765	0·857	
Average ..	..	..	25·7	·1765	·0857	

CONCLUDING SUGGESTIONS.

30. In the light of the figures of growth which have been obtained and the observation made during my tour regarding the culture of Casuarina on the Madras Coast, I have to offer the following suggestions. I would urge that, considering the dearness of fuel in Madras, afforesting the waste lands of the coast should be looked on as a work of public utility; the advantages of this, from an economical point of view, can hardly be over-stated. Coal is brought from England for the railways, and wood fuel for cooking sells in Madras at an average rate of Rs. 10 per ton. Estimates amounting to many lakhs of rupees are before Government for deepening and completing the Buckingham Canal. The Suez Canal

was opened employing manual labor for the earthwork, but the greater portion of the present depth, it is stated, has been attained by steam-dredging. If the price of fuel in Madras were one-half the present rate, it would have to be considered to what extent steam-dredging would reduce the cost of deepening the Buckingham Canal. Steam-dredging in the harbour is an eventuality that has to be kept in view. How the working of the cotton mills and sections of the railways near Madras would be affected by a reduction in the price of fuel to one-half its present price are questions to which there is only one answer. Now 100 miles of coast, supposing the waste land and dunes to be on an average only half a mile broad, afforested with Casuarina would yield not less than 100,000 tons of dry fuel per annum—

Square Miles.		Acres.		Average Acre-increment.	
50	×	640	×	3	= 96,000 tons.

One-half the present price of fuel in Madras, or Rs. 5 per ton, would allow Rs. 4 as the average cost of cutting, sawing up and transport by canal to Madras × Re. 1, a fair seigniorage to Government. It is now recognized that the conservation and improvement by fire protection and culture of the poor scrub forests on the plains and low hills is a public duty. It is a work in which there are many difficulties, and one in which the improvement in the forests and in their yield can only advance slowly in consequence of the poor character of the forest operated upon. The Acre-increment in these forests is variously estimated from 0·1 ton to 0·5 ton; in the majority of the poorer scrub forests it probably does not exceed 0·1 or 0·2 tons, or from $\frac{1}{30}$ to $\frac{1}{15}$ the Acre-increment of Casuarina. The fuel cuttings on the Sríharikót Island have apparently been too irregular to admit of arriving at even an approximate estimate of the Acre-increment. The "Kandam" or blocks are of unequal area, and the current rotation, which it was intended should have been of eight years, will take twelve or fourteen years to complete. The cutting there is done by pollarding a system tending to lower the Acre-increment and impair natural reproduction. The facilities afforded by the unrivalled water carriage of the Buckingham Canal and the healthy climate of the coast are unique and very powerful recommendations in favor of afforesting the dunes and sand wastes of the sea-board. In a purely forest point of view, the Acre-increment realizable would place the project above every other. The cost of the operation would, of course, depend entirely on how it was managed. To neglect such an opportunity would appear comparable to leaving a coal mine unworked within easy reach of a large city where fuel was unusually dear and scarce.

If the proposal of afforesting the dunes and sand wastes of the coast with Casuarina were approved, the one object to be kept steadily in view should be to get the ground covered as rapidly as possible with not less than 150 trees to the acre. Looking at the figures of growth, it is probable that the Individual-increment rises up to about this limit of sparseness of stock; there is no material loss in the Acre-increment, provided the sparseness of planting does not fall below 200 to the acre. In these afforesting operations, therefore, it should be remembered that the number of trees to the acre cannot fall below 150 to the acre without a loss in the yield of wood, and that it is more economical to plant up fresh waste than to put in more than 200 trees to the acre. If waste land were granted free, planters would be willing, as long as the present high rates for fuel lasted, to plant Casuarina on the condition of surrendering the plantation to Government after the first crop had been cut; this crop to be taken within ten years, and by coppicing so as to leave stools 1 foot above the ground. Land so treated would probably require only skilful cutting to convert it into regular High-forest workable on a rotation of about twenty years. Independently of this, planting by departmental agency must be prosecuted as vigorously as possible, for till the sand dunes and wastes are covered with foliage, a splendid natural advantage remains unutilized; the fresh water 5 feet below the surface sinks unutilized into the sea, the powerful light and heat are wasted on a desert of sand. As has been remarked, 200 trees to the acre (say 15 feet × 15 feet) would, in direct planting, be the most economical, but sparser planting should have an early trial, say about 100 trees to the acre, in which each tree would be multiplied by coppicing and by cutting so as to utilize the reproduction from the trailing side branches.

This class of planting would have the advantage of yielding an early revenue before any great decline in the price of firewood took place, which revenue could, of course, be devoted to the enlargement of planting operations. It might be desirable to devote a fixed sum, say for ten years, to the project of afforesting the dunes and sand wastes of the coast, after which the grant might be discontinued, and the work of planting allowed to go forward solely by its own revenue; or the grant might be continued, or increased, according to circumstance.

REPRODUCTION OF CASUARINA FOREST.

31. In the above calculation the seigniorage or profit to Government on each ton of firewood produced is entered at one rupee. Supposing forest thus formed were worked on a rotation of twenty years, there would be a profit of about—

Years.		Acre-increment.		Rs.
20	×	3	=	60 per acre.

Supposing that natural reproduction failed entirely, Rs. 60 would amply suffice to replant the area artificially. Natural reproduction of Casuarina on the dry portions of the Mysore plateau, where are the large Casuarina plantations, fails entirely; on the Madras Coast natural reproduction of Casuarina occurs in three ways—first, from coppice; second, from self-sown seedlings; third, from the rooting of the trailing branches at the base. Casuarina on the coast does not coppice well unless 1 or 2 feet of stump are left above ground, and even then it depends on the moistness of the locality whether a large proportion of the stumps do not fail to shoot. As has been mentioned, in the Sample-areas D and E of *Tumalapenta*, where the trees were cut at the ground level, only 474 stools out of 1,750 threw up shoots; but as has been mentioned elsewhere, when at 1 or 2 feet above the ground the proportion of coppice shoots is much higher, and it appears that stools which have once coppiced successfully do so again with great facility.

Self-sown seedlings are numerous in certain localities, especially near old trees, on loose soil, and when there is abundant subsoil moisture. Most probably self-sown seedlings would play a very large part in the natural reproduction of a sparse forest of Casuarina worked on a rotation of twenty years.

The rooting of the lowest trailing branches of Casuarina was first shown me by Dr. Brandis.* It is an extremely interesting property of the Casuarina, unfortunately entirely absent on the hard loams of the Mysore plateau, but very common on the loose sands all along the coast. In systematic reproductive cuttings of a forest it would probably be an important factor.

REMARKS ON PLANTING IN THE NELLORE DISTRICT.

32. It is too late now to regret the cost of Casuarina planting in the Nellore District; the annual expenditure on Casuarina planting has been from Rs. 20,000 to 30,000, *vide* Colonel Beddome's report, dated 8th May 1880. Under the expensive system of watering followed, the average expenditure for work (exclusive of supervision) on each established tree is four annas. Planting at the extraordinary rate of 2,000 trees per acre, makes the cost of planting reach the almost incredible figure of *Rs. 500 per acre.* The average cost of planting in Government plantations throughout India (except Madras and Bombay) is about Rs. 42 per acre; the cost of Casuarina planting in Mysore (500 trees to the acre) is Rs. 23 per acre. I should mention that the Wood Overseer has shown me letters in which he protested in vain against this very close planting. Colonel Beddome, on being appealed to, advocated planting 6 feet × 6 feet. Two years ago he unfortunately fell ill on his way to visit these plantations. I believe that they have never hitherto been visited by a Forest Officer. Six feet × six feet is a far less disastrous distance to plant at than $4\frac{1}{2}$ feet × $4\frac{1}{2}$ feet; it gives rather more than half the number of trees per acre, and, if early and heavily thinned, would doubtless yield good figures of growth; but with such a light-loving tree as Casuarina, and one

* NOTE.—I regret to say that this property of the Casuarina, so common in private forests near Madras, was not once noticed by me on a late inspection in any of the Nellore Government Plantations—J.S.G.

which, even when quite isolated, takes a good shape, it is false economy to plant so close. At five years of age the 6 feet × 6 feet planting in F Sample-area of *Tumalapenta* yielded the poor Acre-increment of $2\frac{1}{2}$ tons.

In considering the best distance apart at which to plant, we have to take the two cases—first, where land is limited and the object aimed at is the highest possible Acre-increment (cropping at what is known as the Commercial Maturity period); second, where land is unlimited and the object is to plant the greatest acreage consistent with a good growth. The first is the case of a private individual planting Casuarina purely for profit, the second of Government planting Casuarina for a forest. The figures of Casuarina growth both in Mysore and on the Madras Coast indicate 12 feet × 12 feet as a good distance for planting in the first case and 15 feet × 15 in the second. In Mysore Casuarina was planted 15 feet × 15 feet for many years, which distance I subsequently altered to 9 feet × 9 feet; it was a pleasant surprise, a few months ago, that the 15 feet × 15 feet planting should have yielded so good an Acre-increment as 5·5 tons, *vide* report on growth of Casuarina in the Mysore plantations. The distance of planting in the Mysore plantation was altered from 15 feet × 15 feet to 9 feet × 9 feet, chiefly for cultural reasons, relating to the suppression of scrub and of grass for fire protection. These reasons do not exist on the Madras Coast; and further, the system of planting followed by both private individuals and by Government is much more expensive than the Mysore system of planting, making it so much the more economical to plant spare. It remains to test in practice whether the Mysore system of Casuarina planting, coasting from 1 anna to $1\frac{1}{2}$ annas per established tree, could not be practised on the coast. An account of this system was circulated to all Forest Officers under the Government of India about two years ago and reprinted subsequently in the *Indian Forester*.

TUMALAPENTA PLANTATION.

SAMPLE PLOT A. (Planted about 12′ × 12′, area 0·4244 acres.)

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	22	41	10·96	57	16	43	6·08
2	16	40	5·65	58	21	46	11·21
3	18	47	8·41	59	14	30	3·24
4	18	44	7·87	60	23	50	14·61
5	17	34	5·43	61	26	51	19·05
6	23	56	16·37	62	18	46	8·23
7	17	44	7·02	63	19	38	7·58
8	24	56	17·82	64	15	35	4·35
9	9	24	1·07	65	26	40	14·94
10	24	50	15·91	66	15	34	4·22
11	20	47	10·38	67	14	23	2·49
12	20	56	12·37	68	15	40	4·97
13	18	47	8·41	69	22	37	9·89
14	18	54	9·66	70	20	51	11·27
15	21	50	12·18	71	24	45	14·32
16	19	52	10·37	72	20	36	7·95
17	14	30	3·24	73	19	45	8·97
18	19	50	9·97	74	25	52	17·96
19	22	40	10·69	75	16	44	6·22
20	18	46	8·23	76	21	51	12·42
21	17	42	6·70	77	24	48	15·27
22	21	37	9·01	78	24	47	14·96
23	22	44	11·76	79	25	56	19·34
24	23	52	15·20	80	24	48	15·27
25	18	45	8·05	81	27	46	18·53
26	17	47	7·50	82	24	47	14·96
27	19	45	8·97	83	16	39	5·51
28	20	48	10·61	84	18	45	8·05
29	21	44	10·72	85	21	51	12·42
30	16	41	5·80	86	21	46	11·21
31	19	40	7·97	87	15	36	4·47
32	23	42	12·27	88	21	30	7·31
33	26	43	16·06	89	15	36	4·47
34	22	43	11·50	90	16	31	4·38
35	12	29	2·30	91	17	36	5·74
36	19	40	7·97	92	19	48	9·57
37	20	47	10·38	93	21	46	11·21
38	14	43	4·65	94	15	45	5·59
39	19	36	7·18	95	17	40	6·38
40	16	42	5·94	96	18	47	8·41
41	15	38	4·72	97	16	46	6·50
42	17	48	7·66	98	14	31	3·35
43	17	44	7·02	99	23	47	13·73
44	20	47	10·38	100	17	42	6·70
45	23	52	15·20	101	20	50	11·05
46	11	41	2·74	102	21	55	13·40
47	13	38	3·54	103	16	46	6·50
48	15	42	5·22	104	23	40	11·69
49	20	54	11·93	105	18	46	8·23
50	17	50	7·98	106	9	34	1·52
51	19	42	8·37	107	20	46	10·16
52	19	49	9·77	108	18	42	7·52
53	20	50	11·05	109	18	47	8·41
54	18	55	9·84	110	21	48	11·69
55	12	46	3·66	111	13	37	3·45
56	15	56	6·96	112	16	39	5·51

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT A—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
113	12	25	1·98	119	20	43	9·50
114	19	38	7·58	120	18	38	6·80
115	16	45	6·36	121	24	57	18·14
116	21	51	12·42				
117	14	40	4·33				
118	16	45	6·36				
				Total ...	2,262	5,293	1094·49
				Average ...	13·69	43·74	9·05
				Maximum ...	27	46	18·53
				Minimum ...	9	24	1·07

Calculation of Results.

The factor to be used, see next table, is 0·57 cubic feet per tree, obtained from the measurements of 10 trees cut in this plot.

The total stock on the sample area is = 1094·49 × 0·57 = 623·86 cubic feet.

The stock per acre therefore is = 623·86 cubic feet ÷ 0·4244 acres = 1469·98 cubic feet.

The total number of trees on the sample plot = 121.

Therefore, the number of trees per acre = 121 ÷ 0·4244 = 285·11 trees.

The average contents of each tree = $\frac{1469 \cdot 98}{285 \cdot 11}$ = 5·15 cubic feet.

The yearly individual increment is therefore = $\frac{5 \cdot 15}{5 \cdot 5}$ = 0·94 cubic feet, the plantation being considered to be 5·5 years old.

In order, however, to obtain the most accurate data we must also take into consideration the possible amount which *blanks* in the canopy would give as well as the amount obtained from *thinnings.* Judging by a tree blown down in the cyclone, the number of *blanks* may be estimated at 2 per acre, equivalent to 10·3 cubic feet according to the calculation given above. As regards *thinnings* none have ever been made, the plot having been an experimental plantation.

The amount of material on an acre may therefore be taken as the sum of the *actual stock, blanks* and *thinnings,* or 1469·98 + 10·3 = 1480·28 cubic feet, representing a yearly acre-increment of $\frac{1480 \cdot 28}{5 \cdot 5}$ = 269·14 cubic feet = (at 45 cubic feet per ton) 5·98 tons.

Calculation of Form-factor.

No. of Tree.	Girth at 5 feet above ground.	Height of Tree (Total).	Ideal Cylinder from Girth at 5 feet.	Cubic Content from 10 feet sections of stem.	CUBIC CONTENT OF TOP AND BRANCHES BY WEIGHING. Wood.	Twigs.	True Cubic Content of Tree (5 + 6.)	Reducing-factor (7 ÷ 4).	REMARKS.
1	2	3	4	5	6		7	8	
1	19	47	9·37	3·22	1·31	0·33	4·86	0·52	Tree broken in a cyclone a few years ago.
2	16	48	6·79	2·93	0·86	0·35	4·14	0·61	
3	16	49	6·93	3·16	0·29	0·27	3·72	0·54	
4	16	53	7·49	3·05	0·88	0·26	4·15	0·56	
5	16	50	7·07	2·64	0·69	0·20	3·53	0·50	
6	18	52	9·31	4·17	1·26	0·60	6·03	0·65	Stem small; whole tree weighed.
7	15	40	4·97	1·79	0·58	0·21	2·58	0·52	
8	19	46	9·17	..	5·06	0·29	5·35	0·58	
9	17	49	7·82	3·07	0·88	0·32	4·27	0·55	
10	21	53	12·91	4·98	2·18	1·02	8·18	0·63	
Total ..	173	487	81·83	29·01	13·99	3·85	46·85	5·66	
Mean ..	17·3	48·7	8·18	2·90	1·40	0·38	4·68	0·566	

Form-factor 46·85 ÷ 81·83 = 0·572.

NOTE.—In the above it is noteworthy that the first value for the Form-factor is the lesser, the reverse being usually the case in a close plantation, where the larger, taller trees have Form-factors below the average. Here Tree No. 10, with an unusually large developed head, has a high Form-factor, and, being in size twice the average, it has tended to slightly raise the second value of the Form-factor above the first.

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT B. (Planted about 11′ × 11′, area 0·4802 acres.)

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	11	30	2·00	60	9	25	1·11
2	10	31	1·71	61	10	40	2·21
3	11	33	2·20	62	7	35	0·94
4	10	29	1·60	63	6	24	0·47
5	12	32	2·54	64	8	29	1·02
6	11	30	2·00	65	9	33	1·47
7	10	31	1·71	66	8	30	1·06
8	11	34	2·27	67	11	34	2·27
9	9	30	1·34	68	10	26	1·43
10	9	30	1·34	69	9	27	1·20
11	10	28	1·54	70	9	27	1·20
12	14	28	3·03	71	10	32	1·76
13	13	34	3·17	72	4	18	0·16
14	10	33	1·82	73	6	20	0·39
15	11	28	1·87	74	7	27	0·73
16	9	30	1·34	75	9	27	1·20
17	15	35	4·35	76	9	28	1·25
18	10	30	1·65	77	11	32	2·13
19	12	30	2·38	78	13	35	3·26
20	10	34	1·87	79	11	35	2·34
21	12	33	2·62	80	8	22	0·77
22	11	34	2·27	81	7	29	0·78
23	9	30	1·34	82	6	20	0·39
24	10	31	1·71	83	5	23	0·32
25	12	32	2·54	84	10	29	1·60
26	11	34	2·27	85	7	29	0·78
27	10	32	1·76	86	8	30	1·06
28	9	32	1·43	87	13	35	3·26
29	11	32	2·13	88	8	28	0·99
30	12	42	3·34	89	9	29	1·29
31	12	30	2·38	90	10	30	1·65
32	11	34	2·27	91	10	29	1·60
33	13	30	2·80	92	14	35	3·79
34	10	32	1·76	93	12	33	2·62
35	14	34	3·68	94	10	31	1·71
36	12	35	2·78	95	8	31	1·09
37	15	28	3·48	96	11	32	2·13
38	12	37	2·94	97	11	32	2·13
39	10	31	1·71	98	12	34	2·70
40	10	30	1·65	99	11	30	2·00
41	10	33	1·82	100	11	33	2·20
42	7	25	0·67	101	11	32	2·13
43	10	28	1·54	102	16	37	5·23
44	10	31	1·71	103	14	37	4·00
45	10	30	1·65	104	10	34	1·87
46	11	34	2·27	105	9	29	1·29
47	10	30	1·65	106	11	33	2·20
48	10	35	1·93	107	12	32	2·54
49	11	40	2·67	108	9	34	1·52
50	10	34	1·87	109	11	31	2·07
51	11	32	2·13	110	9	29	1·29
52	7	25	0·67	111	12	32	2·54
53	6	32	0·63	112	8	28	0·99
54	10	33	1·82	113	10	30	1·65
55	9	20	0·89	114	11	35	2·34
56	8	30	1·06	115	12	37	2·94
57	11	34	2·27	116	8	30	1·06
58	10	30	1·65	117	11	34	2·27
59	10	30	1·65	118	10	31	1·71

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT B—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
119	11	32	2·13	156	11	31	2·07
120	12	31	2·46	157	11	31	2·07
121	12	32	2·54	158	9	22	0·98
122	12	33	2·62	159	6	10	0·19
123	12	33	2·62	160	11	22	1·47
124	13	28	2·61	161	11	27	1·80
125	11	34	2·27	162	8	18	0·63
126	13	34	3·17	163	14	28	3·03
127	10	32	1·76	164	9	19	0·85
128	10	27	1·49	165	8	27	0·95
129	12	32	2·54	166	9	22	0·98
130	10	25	1·38	167	7	16	0·43
131	10	32	1·76	168	4	15	0·13
132	11	28	1·87	169	6	20	0·39
133	12	22	1·75	170	6	21	0·41
134	12	31	2·46	171	5	20	0·27
135	14	36	3·89	172	9	22	0·98
136	16	31	4·38	173	10	27	1·49
137	12	33	2·62	174	9	22	0·98
138	10	31	1·71	175	10	29	1·60
139	8	29	1·02	176	9	25	1·11
140	15	35	4·35	177	10	23	1·27
141	10	30	1·65	178	9	24	1·07
142	11	30	2·00	179	11	33	2·20
143	11	31	2·07	180	12	36	2·86
144	10	31	1·71	181	10	29	1·60
145	9	32	1·43	182	10	29	1·60
146	10	31	1·71	183	10	30	1·65
147	9	30	1·34	184	5	18	0·25
148	12	32	2·54				
149	8	29	1·02	Total ...	1,867	5,494	337·58
150	12	33	2·62				
151	11	32	2·13	Average ...	10·75	29·86	1·83
152	12	31	2·46				
153	11	32	2·13	Maximum ...	16	37	5·23
154	8	27	0·95				
155	10	34	1·87	Minimum ...	4	15	0·13

TUMALAPENTA PLANTATION—(*Continued*).

PLOT B—(*Continued*).

Calculation of Results.

The factor to be used, see next table, is 0·675 cubic feet per tree, obtained from the measurements of 10 trees cut in this plot.

The total stock on the sample area is = 337·58 × 0·675 = 227·87 cubic feet.

The stock per acre therefore is = 227·87 cubic feet ÷ 0·4802 acres = 474·52 cubic feet.

The total number of trees on the sample plot = 184.

Therefore, the number of trees per acre = 184 ÷ 0·4802 = 383·17 trees.

The average contents of each tree $= \frac{474 \cdot 52}{383 \cdot 17} = 1 \cdot 24$ cubic feet.

The yearly individual increment is therefore $= \frac{1 \cdot 24}{3 \cdot 5} = 0 \cdot 35$ cubic feet, the plantation being considered to be 3·5 years old.

In order, however, to obtain the most accurate data we must also take into consideration the possible amount which *blanks* in the canopy would give as well as the amount obtained from *thinnings*. The number of *blanks* may be estimated at 5 per acre, equivalent to 6·19 cubic feet according to the calculation given above. As regards *thinnings* none have been made, the plot having been an experimental plantation.

The amount of material on an acre may therefore be taken as the sum of the *actual stock*, *blanks* and *thinnings*, or 474·52 + 6·19 = 480·71 cubic feet, representing a yearly acre-increment of $\frac{480 \cdot 71}{3 \cdot 5} = 137 \cdot 34$ cubic feet. = (at 45 cubic feet per ton) 3·05 tons.

Calculation of Form-factor.

No. of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content from 10 feet sections of stem.	Cubic Content of Top and Branches by Weighing.		True Cubic Content of Tree (5 + 6.)	Form-factor (7 ÷ 4).	Remarks.
					Wood.	Twigs.			
1	2	3	4	5	6		7	8	
1	8	32	1·13	0·54	0·10	0·11	0·75	0·66	
2	9	29	1·29	0·44	0·25	0·13	0·82	0·64	
3	11	38	2·54	1·01	0·56	0·30	1·87	0·74	
4	10	30	1·65	0·69	0·31	0·21	1·21	0·73	
5	12	33	2·62	1·06	0·51	0·31	1·88	0·72	
6	12	34	2·70	..	1·22	0·22	1·44	0·53	Stem small; whole tree weighed.
7	11	36	2·40	1·01	0·31	0·24	1·56	0·65	
8	8	31	1·09	0·49	0·11	0·11	0·71	0·55	
9	9	30	1·34	0·63	0·39	0·20	1·22	0·91	
10	10	31	1·71	0·74	0·15	0·12	1·01	0·59	
Sum ..	100	324	18·47	6·61	3·91	1·95	12·47	6·82	
Mean ..	10·0	32·4	1·85	0·66	0·39	·19	1·25	0·68	

Form-factor 12·47 ÷ 18·47 = 0·675.

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT C. (Planted about 11′ × 11′, area 0·1739 acres.)

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	15	46	5·71	38	12	23	1·83
2	17	37	5·90	39	12	36	2·86
3	22	56	14·97	40	15	30	3·73
4	15	43	5·34	41	23	48	14·03
5	20	53	11·71	42	18	52	9·31
6	19	51	10·17	43	11	45	3·00
7	20	50	11·05	44	14	44	4·76
8	24	50	15·91	45	14	40	4·33
9	19	39	7·78	46	16	48	6·79
10	19	55	10·97	47	24	54	17·18
11	21	56	13·64	48	16	52	7·35
12	23	60	17·54	49	23	53	15·49
13	20	48	10·61	50	16	50	7·07
14	13	39	3·64	51	22	46	12·30
15	14	42	4·54	52	12	36	2·86
16	14	41	4·44	53	14	31	3·35
17	11	40	2·67	54	11	32	2·13
18	31	60	31·86	55	19	43	8·57
19	27	58	23·36	56	14	29	3·14
20	23	45	13·15	57	17	43	6·86
21	20	40	8·84	58	16	45	6·36
22	24	56	17·82	59	18	38	6·80
23	19	53	10·57	60	20	58	12·82
24	16	41	5·80	61	14	47	5·09
25	14	44	4·76	62	19	41	8·17
26	16	53	7·49	63	16	42	5·94
27	12	39	3·10	64	24	52	16·55
28	7	26	0·70	65	20	55	12·15
29	10	29	1·60				
30	19	51	10·17				
31	17	50	7·98	Total ...	1,143	2,916	565·09
32	17	37	5·90				
33	21	53	12·91				
34	17	45	7·18	Average ...	17·58	44·86	8·69
35	21	31	7·55				
36	14	38	4·11	Maximum ...	31	60	31·86
37	22	48	12·83	Minimum ...	7	26	0·70

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TUMALAPENTA PLANTATION—(*Continued*).

PLOT C—(*Continued*).

Calculation of Results.

The factor to be used, see next table, is 0·53 cubic feet per tree, obtained from the measurements of 10 trees cut in this plot.

The total stock on the sample area is = 565·09 × 0·53 = 299·5 cubic feet.

The stock per acre therefore is = 299·5 cubic feet ÷ 0·1739 acres = 1722·25 cubic feet.

The total number of trees on the sample plot = 65.

Therefore, the number of trees per acre = 65 ÷ 0·1739 = 373·78.

The average contents of each tree = $\frac{1722 \cdot 25}{373 \cdot 78}$ = 4 6077 cubic feet.

The yearly individual increment is therefore = $\frac{4 \cdot 6077}{9}$ = ·512 cubic feet, the plantation being considered to be nine years old.

In order, however, to obtain the most accurate data we must also take into consideration the possible amount which *blanks* in the canopy would give as well as the amount obtained from *thinnings*.

The number of *blanks* may be estimated at four average trees or 23 per acre, equivalent to 105·98 cubic feet according to the calculation given above. As regards *thinnings* none have ever been made, the plot having been an experimental plantation.

The amount of material on an acre may, therefore, be taken as the sum of the *actual stock*, *blanks* and *thinnings*, or 1722·25 + 105·98 = 1828·23 cubic feet, representing a yearly acre-increment of $\frac{1828 \cdot 23}{9}$ = 203·14 cubic feet;

= (at 45 cubic feet per ton) 4·514 tons.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Height of Tree (Total).	Ideal Cylinder from Girth at 5 feet and Total Height.	Cubic Content from 10 feet sections of stem.	Cubic Content of Top and Branches by Weighing.		True Cubic Content of Tree (5 + 6).	Form Factor (7 ÷ 4).
					Wood.	Twigs.		
1	2	3	4	5	6		7	8
1 ...	23	55	16·07	7·71	1·29	0·34	9·34	0·58
2 ...	17	50	7·98	3·60	0·74	0·37	4·71	0·59
3 ...	16	44	6·22	2·42	0·54	0·26	3·22	0·52
4 ...	16	41	5·80	1·82	0·10	0·06	1·98	0·34
5 ...	14	44	4·76	2·09	0·47	0 15	2·71	0·57
6 ...	14	52	5·63	2·18	0·39	0·14	2·71	0·48
7 ...	16	46	6·50	2·64	0·57	0·27	3·48	0 54
8 ...	21	51	12·42	4·22	1·47	0·50	6·19	0·50
9 ...	12	37	2·94	1·23	0·39	0·12	1·74	0·59
10 ...	13	40	3·73	1·56	0·36	0·16	2·08	0·56
Total ...	162	460	72·05	29·47	6·32	2·37	38·16	5·27
Mean ...	16·2	46·0	7·21	2·95	0·63	0·24	3·82	0·53

Form-factor 38·16 ÷ 72·05 = 0·530.

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT D.

Number of Tree.	Girth at 5 Feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 Feet.	Height of Tree.	Ideal Cylinder.
1	10	34	1·87	60	12	42	3·34
2	6	18	0·35	61	11	40	2·67
3	7	20	0·54	62	5	25	0·35
4	5	20	0·27	63	5	21	0·29
5	5	20	0·27	64	6	25	0·49
6	8	36	1·27	65	5	37	0·51
7	9	33	1·47	66	13	43	4·01
8	13	38	3·54	67	9	34	1·52
9	9	33	1·47	68	8	34	1·20
10	10	38	2·09	69	9	34	1·52
11	7	34	0·92	70	8	36	1·27
12	9	34	1·52	71	11	40	2·67
13	9	35	1·56	72	6	25	0·49
14	6	17	0·33	73	11	44	2·94
15	11	35	2·34	74	8	38	1·34
16	8	25	0·88	75	9	34	1·52
17	6	23	0·45	76	5	28	0·39
18	7	25	0·67	77	7	32	0·86
19	8	36	1·27	78	7	26	0·70
20	14	42	4 54	79	12	36	2·86
21	6	25	0·49	80	10	39	2·15
22	11	40	2·67	81	9	35	1·56
23	11	40	2·67	82	8	40	1·41
24	10	40	2·21	83	6	34	0·67
25	9	35	1·56	84	4	22	0·19
26	10	40	2·21	85	6	24	0·47
27	8	30	1·06	86	10	42	2·32
28	9	34	1·52	87	11	40	2·67
29	7	29	0·78	88	7	35	0·94
30	5	24	0·34	89	9	34	1·52
31	5	20	0 27	90	6	38	0·75
32	6	29	0·57	91	7	34	0·92
33	10	40	2·21	92	9	35	1·56
34	7	33	0·89	93	8	35	1·23
35	7	32	0·86	94	10	40	2·21
36	9	34	1·52	95	7	29	0·78
37	6	26	0 51	96	10	36	1·98
38	11	43	2·87	97	9	34	1·52
39	11	43	2·87	98	7	32	0·86
40	8	34	1·20	99	7	30	0 81
41	8	34	1·20	100	4	24	0·21
42	7	26	0·70	101	6	24	0·47
43	7	32	0·86	102	5	23	0·32
44	10	42	2·32	103	10	46	2·54
45	9	30	1·34	104	8	35	1·23
46	12	44	3·50	105	7	32	0·86
47	10	42	2·32	106	11	39	2·60
48	10	35	1·93	107	9	35	1 56
49	9	38	1·70	108	10	39	2·15
50	9	36	1·61	109	7	30	0·81
51	7	26	0·70	110	11	39	2·60
52	8	34	1·20	111	6	26	0·51
53	6	24	0·47	112	10	36	1 98
54	8	34	1·20	113	8	31	1·09
55	9	36	1·61	114	6	31	0·61
56	9	36	1·61	115	10	40	2·21
57	10	39	2·15	116	8	35	1·23
58	7	34	0·92	117	10	39	2·15
59	12	41	3·26	118	5	23	0·32

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TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT D—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
119	7	34	0·92	179	8	34	1·20
120	9	35	1·56	180	11	41	2·74
121	12	40	3·18	181	7	31	0·83
122	8	34	1·20	182	8	33	1·16
123	8	34	1·20	183	10	40	2·21
124	9	35	1·56	184	11	38	2·54
125	6	26	0·51	185	7	30	0·81
126	10	38	2·09	186	4	20	0·18
127	10	32	1·76	187	9	38	1·70
128	7	32	0·86	188	7	34	0·92
129	10	35	1·93	189	9	40	1·79
130	12	43	3·42	190	9	33	1·47
131	11	40	2·67	191	7	34	0·92
132	9	34	1·52	192	10	38	2·09
133	7	30	0·81	193	8	32	1·13
134	10	38	2·09	194	6	25	0·49
135	8	35	1·23	195	12	40	3·18
136	5	20	0·27	196	6	30	0·59
137	8	30	1·06	197	12	40	3·18
138	12	41	3·26	198	11	38	2·54
139	13	44	4·10	199	7	30	0·81
140	8	34	1·20	200	6	38	0·75
141	8	34	1·20	201	5	20	0·27
142	13	41	3·82	202	9	38	1·70
143	11	42	2·80	203	10	41	2·26
144	8	32	1·13	204	10	40	2·21
145	8	31	1·09	205	7	30	0·81
146	9	35	1·56	206	11	38	2·54
147	7	33	0·89	207	9	35	1·56
148	11	41	2·74	208	7	30	0·81
149	7	43	1·16	209	6	26	0·51
150	10	43	2·37	210	10	36	1·98
151	7	34	0·92	211	10	40	2·21
152	9	43	1·92	212	5	20	0·27
153	3	15	0·07	213	7	34	0·92
154	5	20	0·27	214	10	40	2·21
155	4	16	0·14	215	6	33	0·65
156	7	32	0·86	216	6	24	0·47
157	6	27	0·53	217	9	31	1·38
158	10	40	2·21	218	4	15	0·13
159	12	40	3·18	219	16	48	6·79
160	10	39	2·15	220	9	34	1·52
161	7	34	0·92	221	16	35	4·95
162	12	42	3·34	222	5	23	0·32
163	9	44	1·96	223	12	40	3·18
164	9	46	2·05	224	10	38	2·09
165	8	38	1·34	225	10	40	2·21
166	13	46	4·29	226	12	40	3·18
167	9	36	1·61	227	9	40	1·79
168	8	35	1·23	228	7	30	0·81
169	8	36	1·27	229	11	38	2·54
170	10	40	2·21	230	11	36	2·40
171	5	20	0·27	231	9	34	1·52
172	10	34	1·87	232	7	28	0·75
173	7	32	0·86	233	10	36	1·98
174	8	34	1·20	234	6	28	0·55
175	10	38	2·09	235	8	35	1·23
176	13	40	3·73	236	6	30	0·59
177	8	34	1·20	237	10	40	2·21
178	10	42	2·32	238	11	36	2·40

TUMALAPENTA PLANTATION—(*Continued*).

Sample Plot D—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
239	13	41	3·82	299	6	24	0·47
240	11	43	2·87	300	7	34	0·92
241	12	40	3·18	301	6	34	0·67
242	9	34	1·52	302	11	34	2·27
243	10	40	2·21	303	11	46	3·07
244	4	20	0·18	304	9	36	1·61
245	8	35	1·23	305	8	34	1·20
246	6	30	0·59	306	10	32	1·76
247	6	31	0·61	307	9	38	1·70
248	9	34	1·52	308	8	30	1·06
249	12	43	3·42	309	10	35	1·93
250	10	40	2·21	310	14	43	4·65
251	7	30	0·81	311	10	38	2·09
252	9	32	1·43	312	7	30	0·81
253	10	40	2·21	313	13	43	4·01
254	6	24	0·47	314	10	36	1·98
255	5	15	0·21	315	5	26	0·36
256	10	40	2·21	316	5	23	0·32
257	11	38	2·54	317	9	38	1·70
258	9	32	1·43	318	7	31	0·83
259	12	40	3·18	319	13	41	3·82
260	11	41	2·74	320	8	34	1·20
261	9	40	1·79	321	8	35	1·23
262	6	13	0·25	322	11	39	2·60
263	6	24	0·47	323	6	31	0·61
264	10	40	2·21	324	9	32	1·43
265	6	20	0·39	325	7	29	0·78
266	7	24	0·64	326	5	20	0·27
267	11	42	2·80	327	6	36	0·71
268	5	25	0·35	328	6	37	0·73
269	6	25	0·49	329	6	26	0·51
270	11	42	2·80	330	7	30	0·81
271	7	27	0·73	331	7	30	0·81
272	11	44	2·94	332	9	39	1·74
273	7	30	0·81	333	10	34	1·87
274	12	38	3·02	334	7	30	0·81
275	8	34	1·20	335	10	38	2·09
276	5	25	0·35	336	6	36	0·71
277	4	16	0·14	337	8	32	1·13
278	11	41	2·74	338	10	35	1·93
279	6	30	0·59	339	6	27	0·53
280	5	24	0·34	340	6	23	0·45
281	7	32	0·86	341	11	42	2·80
282	6	25	0·49	342	9	34	1·52
283	8	38	1·34	343	11	40	2·67
284	12	39	3·10	344	7	29	0·78
285	5	31	0·43	345	7	30	0·81
286	6	30	0·59	346	5	22	0·30
287	8	30	1·06	347	11	40	2·67
288	12	40	3·18	348	7	33	0·89
289	11	46	3·07	349	10	34	1·87
290	7	31	0·83	350	8	38	1·34
291	8	32	1·13	351	11	42	2·80
292	10	38	2·09	352	11	39	2·60
293	11	39	2·60	353	11	39	2·60
294	9	32	1·43	354	9	34	1·52
295	7	34	0·92	355	12	42	2·80
296	5	32	0·44	356	12	43	2·87
297	13	44	4·10	357	10	38	2·09
298	8	30	1·06	358	6	26	0·51

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT D—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
359	4	16	0·14	419	9	40	1·79
360	10	39	2·15	420	9	40	1·79
361	12	41	3·26	421	4	22	0·19
362	11	47	3·14	422	5	20	0·27
363	8	34	1·20	423	9	37	1·65
364	8	34	1·20	424	9	33	1·47
365	10	38	2·09	425	7	32	0·86
366	7	32	0·86	426	7	31	0·83
367	8	34	1·20	427	7	34	0·92
368	10	45	2·48	428	8	32	1·13
369	10	44	2·43	429	8	31	1·09
370	11	40	2·67	430	8	32	1·13
371	7	37	1·00	431	8	33	1·16
372	4	19	0·17	432	10	40	2·21
373	9	34	1·52	433	8	31	1·09
374	5	35	0·48	434	3	24	0·12
375	7	31	0·83	435	8	35	1·23
376	10	34	1·87	436	8	30	1·06
377	10	35	1·93	437	7	32	0·86
378	5	22	0·30	438	9	33	1·47
379	13	42	3·92	439	7	30	0·81
380	8	33	1·16	440	7	30	0·81
381	9	33	1·47	441	5	21	0·29
382	5	21	0·29	442	12	35	2 78
383	7	31	0·83	443	8	32	1·13
384	7	31	0·83	444	7	26	0·70
385	6	23	0·45	445	9	32	1·43
386	5	22	0·30	446	8	33	1·16
387	6	31	0·61	447	9	31	1·38
388	9	34	1·52	448	8	31	1·09
389	9	83	1·47	449	11	40	2 67
390	6	30	0·59	450	8	35	1·23
391	7	32	0·86	451	9	36	1·61
392	8	31	1·09	452	8	35	1·23
393	11	36	2·40	453	9	34	1·52
394	9	31	1·38	454	8	32	1·13
395	10	36	1·98	455	11	41	2·74
396	9	35	1·56	456	8	33	1·16
397	8	33	1·16	457	8	31	1·09
398	11	37	2·47	458	4	21	0·18
399	8	35	1·23	459	6	28	0·55
400	7	34	0·92	460	9	34	1·52
401	8	33	1·16	461	9	37	1·65
402	7	32	0·86	462	8	32	1·13
403	8	27	0·95	463	10	38	2 09
404	7	30	0·81	464	9	35	1·56
405	7	25	0·67	465	4	20	0·18
406	9	32	1·43	466	11	40	2·67
407	7	26	0·70	467	11	43	2·87
408	10	35	1·93	468	3	21	0·10
409	9	36	1·61	469	8	36	1·27
410	5	21	0·29	470	6	28	0·55
411	4	28	0·25	471	5	22	0·30
412	8	36	1·27	472	9	30	1·34
413	10	37	2·04	473	4	20	0·18
414	9	31	1·38	474	7	30	0·81
415	7	30	0·81	475	11	39	2·60
416	8	33	1·16	476	8	33	1·16
417	5	22	0·30	477	4	21	0·13
418	6	29	0·57	478	10	36	1·98

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT D—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
479	8	34	1·20	538	9	35	1·56
480	5	28	0·39	539	5	25	0·35
481	3	15	0·07	540	13	38	3·54
482	5	30	0·41	541	7	31	0·83
483	10	40	2·21	542	8	30	1·06
484	11	43	2·87	543	7	33	0·89
485	9	33	1·47	544	7	31	0·83
486	9	37	1·65	545	8	32	1·13
487	7	32	0·86	546	8	32	1·13
488	6	26	0·51	547	9	34	1·52
489	10	36	1·98	548	12	43	3·42
490	8	32	1·13	549	5	25	0·35
491	7	31	0·83	550	5	24	0·34
492	9	36	1·61	551	6	23	0.45
493	7	30	0·81	552	6	21	0·41
494	6	29	0·57	553	8	33	1·16
495	4	18	0·16	554	4	22	0·19
496	12	40	3·18	555	12	41	3·26
497	12	37	2·94	556	10	36	1·98
498	4	25	0·22	557	10	33	1·82
499	5	23	0·32	558	8	32	1·13
500	9	32	1·43	559	7	32	0·86
501	7	34	0·92	560	9	35	1·56
502	10	37	2·04	561	7	31	0·83
503	9	36	1·61	562	7	32	0·86
504	7	29	0·78	563	9	33	1·47
505	7	31	0·83	564	10	35	1·93
506	9	35	1·56	565	10	34	1·87
507	5	19	0·26	566	6	31	0·61
508	8	32	1·13	567	6	26	0·51
509	5	21	0·29	568	7	31	0·83
510	8	32	1·13	569	8	33	1·16
511	10	42	2·32	570	12	43	3·42
512	9	34	1·52	571	6	29	0·57
513	9	34	1·52	572	5	22	0·30
514	7	21	0·56	573	9	33	1·47
515	4	19	0·17	574	7	32	0·86
516	8	30	1·06	575	7	30	0·81
517	10	40	2·21	576	5	22	0·30
518	6	26	0·51	577	9	35	1·56
519	8	32	1·13	578	8	35	1·23
520	6	26	0·51	579	6	28	0·55
521	8	36	1·27	580	9	29	1·29
522	5	22	0·30	581	8	34	1·20
523	10	36	1·98	582	9	35	1·56
524	5	29	0·40	583	10	38	2·09
525	10	36	1·98	584	7	27	0·73
526	10	35	1·93	585	11	33	2·20
527	7	31	0·83	586	10	34	1·87
528	12	40	3·18	587	7	30	0·81
529	6	25	0·49	588	7	33	0·89
530	13	43	4·01	589	8	34	1·20
531	6	30	0·59	590	6	30	0·59
532	9	33	1·47	591	9	32	1·43
533	10	36	1·98	592	6	25	0·49
534	6	29	0·57	593	8	32	1·13
535	7	26	0·70	594	6	25	0·49
536	12	45	3·58	595	7	31	0·83
537	6	32	0·63	596	11	40	2·67

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT D—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
597	7	31	0·83	656	6	32	0·63
598	6	25	0·49	657	12	38	3·02
599	10	35	1·93	658	9	34	1·52
600	10	34	1·87	659	15	45	5·59
601	8	34	1·20	660	11	36	2·40
602	7	31	0·83	661	8	33	1·16
603	8	33	1·16	662	6	30	0·59
604	10	41	2·26	663	9	36	1·61
605	7	30	0·81	664	8	34	1·20
606	9	38	1·70	665	5	25	0·35
607	5	21	0·29	666	7	28	0·75
608	9	32	1·43	667	10	34	1·87
609	5	26	0·36	668	10	32	1·76
610	7	28	0·75	669	9	35	1·56
611	8	33	1·16	670	7	25	0·67
612	7	31	0·83	671	12	35	2·78
613	9	34	1·52	672	6	30	0·59
614	7	31	0·83	673	9	33	1·47
615	10	35	1·93	674	7	30	0·81
616	6	25	0·49	675	6	25	0·49
617	9	35	1·56	676	8	31	1·09
618	8	29	1·02	677	11	33	2·20
619	5	25	0·35	678	5	27	0·37
620	9	32	1·43	679	8	32	1·13
621	13	43	4·01	680	6	28	0·55
622	8	32	1·13	681	5	27	0·37
623	12	40	3·18	682	9	34	1·52
624	10	39	2·15	683	6	32	0·63
625	8	31	1·09	684	12	40	3·18
626	9	34	1·52	685	10	36	1·98
627	9	34	1·52	686	7	30	0·81
628	9	35	1·56	687	12	40	3·18
629	10	34	1·87	688	13	42	3·92
630	5	25	0·35	689	10	36	1·98
631	8	32	1·13	690	10	29	1·60
632	6	25	0·49	691	9	35	1·56
633	7	28	0·75	692	7	29	0·78
634	7	31	0·83	693	14	40	4·33
635	6	25	0·49	694	6	25	0·49
636	8	32	1·13	695	10	38	2·09
637	7	31	0·83	696	5	23	0·32
638	10	32	1·76	697	6	27	0·53
639	10	36	1·98	698	6	26	0·51
640	5	27	0·37	699	11	35	2·34
641	7	25	0·67	700	10	36	1·98
642	7	31	0·83	701	8	32	1·13
643	10	41	2·26	702	7	31	0·83
644	6	22	0·43	703	7	34	0·92
645	8	31	1·09	704	5	22	0·30
646	13	42	3·92	705	6	28	0·55
647	11	36	2·40	706	6	31	0·61
648	9	36	1·61	707	8	31	1·09
649	7	28	0·75	708	8	34	1·20
650	8	29	1·02	709	9	36	1·61
651	11	37	2·47	710	11	41	2·74
652	11	34	2·27	711	11	36	2·40
653	11	35	2·34	712	11	38	2·54
654	7	31	0·83	713	8	35	1·23
655	9	35	1·56	714	9	33	1·47

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TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT D—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
715	6	29	0·57	774	7	30	0·81
716	4	20	0·18	775	9	37	1·65
717	12	44	3·50	776	8	35	1·23
718	6	29	0·57	777	9	35	1·56
719	10	41	2·26	778	9	34	1·52
720	4	18	0·16	779	8	35	1·23
721	4	22	0·19	780	7	31	0·83
722	9	31	1·38	781	8	37	1·30
723	11	39	2·60	782	12	45	3·58
724	8	32	1·13	783	13	48	4·48
725	6	29	0·57	784	7	26	0·70
726	12	39	3·10	785	11	36	2·40
727	6	27	0·53	786	5	19	0·26
728	10	37	2·04	787	7	33	0·89
729	6	27	0·53	788	8	34	1·20
730	7	29	0·78	789	6	28	0·55
731	12	40	3·18	790	7	32	0·86
732	5	27	0·37	791	8	35	1·23
733	10	42	2·32	792	8	34	1·20
734	14	44	4·76	793	6	29	0·57
735	11	40	2·67	794	5	27	0·37
736	12	45	3·58	795	8	32	1·13
737	6	20	0·39	796	7	31	0·83
738	11	40	2·67	797	7	33	0·89
739	11	38	2·54	798	5	27	0·37
740	5	20	0·27	799	7	30	0·81
741	7	30	0·81	800	8	32	1·13
742	6	29	0·57	801	8	35	1·23
743	10	35	1·93	802	7	33	0·89
744	9	34	1·52	803	9	35	1·56
745	12	38	3·02	804	10	45	2·48
746	8	36	1·27	805	7	32	0·86
747	12	40	3·18	806	8	25	0·88
748	14	43	4·65	807	6	29	0·57
749	5	26	0·36	808	9	35	1·56
750	10	38	2·09	809	7	28	0·75
751	10	35	1·93	810	9	42	1·88
752	8	33	1·16	811	9	36	1·61
753	11	37	2·47	812	10	47	2·59
754	8	33	1·16	813	9	37	1·65
755	11	41	2·74	814	12	42	3·34
756	8	35	1·23	815	8	36	1·27
757	11	38	2·54	816	5	28	0·39
758	6	26	0·51	817	7	31	0·83
759	9	36	1·61	818	8	35	1·23
760	7	30	0·81	819	5	20	0·27
761	10	38	2·09	820	5	22	0·30
762	13	43	4·01	821	7	32	0·86
763	5	23	0·32	822	6	28	0·55
764	6	27	0·53	823	6	25	0·49
765	6	25	0·49	824	12	45	3·58
766	9	35	1·56	825	11	39	2·60
767	8	35	1·23	826	9	46	2·05
768	8	37	1·30	827	10	46	2·54
769	5	21	0·29	828	9	37	1·65
770	6	27	0·53	829	7	35	0·94
771	10	36	1·98	830	7	35	0·94
772	10	38	2·09	831	9	36	1·61
773	11	42	2·80	832	10	40	2·21

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT D—(*Continued*).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
833	9	38	1·70	845	9	31	1·38
834	7	28	0·75	846	7	32	0·86
835	8	31	1·09	847	9	33	1·47
836	9	30	1·34	848	8	32	1·13
837	11	41	2·74				
838	7	30	0·81	Total ...	7,015	27,964	1224·82
839	8	34	1·20				
840	9	35	1·56	Average ...	8·27	32·98	1·44
841	11	40	2·67				
842	4	20	0·18	Maximum ...	16	48	5·59
843	5	29	0·40				
844	8	31	1·09	Minimum ...	3	13	0·07

Calculation of Results.

The factor to be used, see next table, is 0·5231 cubic feet per tree, obtained from the measurements of 50 trees cut in this plot.

The total stock on the sample area is $= 1224{\cdot}82 \times 0{\cdot}5231 = 640{\cdot}7$ cubic feet.

The stock per acre, therefore, is $= 640{\cdot}7$ cubic feet $\div$ 1 acre $= 640{\cdot}7$ cubic feet.

The total number of trees on the sample plot = 848.

Therefore the number of trees per acre $= 848 \div 1 = 848$ trees.

The average contents of each tree $= \frac{640{\cdot}7}{848} = 0{\cdot}75$ cubic feet.

The yearly individual increment is therefore $= \frac{0{\cdot}75}{9} = {\cdot}084$ cubic feet, the plantation being considered to be nine years old.

In order, however, to obtain the most accurate data, we must also take into consideration the possible amount which *blanks* in the canopy would give as well as the amount obtained from *thinnings*.

Six months ago half the total stock was thinned out quincunx, every alternate tree being felled. The value of this *thinning* is, therefore, $848 \times 8{\cdot}5 \times {\cdot}084 = 605{\cdot}47$ cubic feet. In the planting there were 103 *blanks* and 126 replaced failures now dominated trees and not taken into account.

The amount of material on an acre may, therefore, be taken as the sum of the *actual stock*, *blanks* and *thinnings*, or $640{\cdot}70 + 0 + 605{\cdot}47 = 1246{\cdot}17$ cubic feet, representing a yearly acre-increment of $\frac{1246{\cdot}17}{9} = 138{\cdot}46$ cubic feet;

= (at 45 cubic feet per ton) 3·075 tons.

TUMALAPENTA PLANTATION—(*Continued*).

Plot D.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content of Tree by Weighing.		True Cubic Content of Tree (5 + 6).	Reducing factor* (7 ÷ 5).
				Wood 72 lb. per Cubic Foot.	Twigs and Foliage 200 lb. per Cubic Foot.		
1	2	3	4	5	6	7	8
1	5	22	0·30	0·13	0·02	0·15	0·50
2	9	37	1·65	0·74	0·03	0·77	0·47
3	9	40	1·79	0·82	0·04	0·86	0·48
4	7	27	0·73	0·28	0·03	0·31	0·42
5	8	39	1·37	0·72	0·04	0·76	0·55
6	4	20	0·18	0·08	0·01	0·09	0·50
7	6	33	0·65	0·32	0·01	0·33	0·51
8	7	37	1·00	0·43	0·03	0·46	0·46
9	9	41	1·83	0·89	0·04	0·93	0·51
10	7	36	0·97	0·57	0·03	0·60	0·62
11	11	46	3·07	1·71	0·07	1·78	0·58
12	5	24	0·34	0·18	0·01	0·19	0·56
13	10	41	2·26	1·07	0·06	1·13	0·50
14	11	42	2 80	1·31	0·11	1·42	0·51
15	8	38	1·34	0·61	0·03	0·64	0·48
16	9	37	1·65	0·72	0·04	0·76	0·46
17	9	38	1·70	0·78	0 06	0·84	0·49
18	9	40	1·79	0·96	0·08	1·04	0·58
19	7	28	0·75	0·39	0·03	0·42	0·56
20	12	44	3·50	1·51	0·08	1·59	0·45
21	10	39	2·15	1·14	0·14	1·28	0·60
22	6	23	0·45	0·17	0·02	0·19	0·42
23	11	46	3·07	1·22	0·05	1·27	0·41
24	4	19	0·17	0·08	0·01	0·09	0·53
25	7	32	0·86	0·26	0·03	0·29	0·34
26	8	32	1·13	0·57	0·04	0·61	0·54
27	9	35	1·56	0·57	0·05	0·62	0·40
28	9	33	1·47	0·61	0·05	0·66	0·45
29	6	26	0·51	0·21	0·03	0·24	0·47
30	6	28	0·55	0·22	0·03	0·25	0·45
31	9	34	1·52	0·63	0·04	0·67	0 44
32	11	40	2·67	1·42	0·14	1·56	0·58
33	10	38	2·09	0·97	0·07	1·04	0·50
34	10	38	2·09	0 90	0·07	0·97	0·46
35	9	34	1·52	0·74	0·10	0·84	0·55
36	8	38	1·34	0·75	0·06	0·81	0 60
37	10	38	2·09	1·25	0·13	1·38	0·66
38	9	37	1·65	0·88	0·10	0·98	0·59
39	7	27	0·73	0·31	0·06	0·37	0·51
40	9	37	1·65	0·74	0·08	0·82	0·50
41	10	41	2·26	1·10	0 16	1·26	0·56
42	9	40	1·79	0·78	0·05	0·83	0·46
43	9	34	1·52	0·68	0·07	0·75	0·49
44	10	39	2·15	1·10	0·10	1·20	0·56
45	9	38	1·70	0·97	0·10	1·07	0·63
46	8	35	1·23	0·74	0·10	0·84	0·68
47	7	28	0·75	0·44	0·06	0·50	0·67
48	9	37	1·65	0·88	0·08	0·96	0·58
49	6	30	0·59	0·35	0·04	0·39	0·66
50	8	38	1·34	0·78	0·08	0·86	0·64
Total ...	415	1744	73·92	35·68	2·99	38·67	26·12
Mean ...	8·30	34·88	1·48	0·71	0·60	7·73	0·5224

Form-factor = 38·67 ÷ 73·92 = 0·5231.

TUMALAPENTA PLANTATION—(*Continued*).

PLOT E.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder from Girth at 5 feet.	CUBIC CONTENT OF TREE BY WEIGHING. Wood 72 lb. per Cubic Foot.	CUBIC CONTENT OF TREE BY WEIGHING. Twigs and Foliage 200 lb. per Cubic Foot.	True Cubic Content of Tree (5 + 6).	Reducing-factor (7 ÷ 4).
1	2	3	4	5	6	7	8
1	8	37	1·30	0·74	0·06	0·80	0·62
2	6	26	0·51	0·29	0·04	0·33	0·65
3	6	24	0·47	0·28	0·03	0·31	0·66
4	5	20	0·27	0·15	0·02	0·17	0·63
5	7	29	0·78	0·42	0·05	0·47	0·60
6	7	26	0·70	0·44	0·06	0·50	0·71
7	7	24	0·64	0·31	0·04	0·35	0·55
8	9	26	1·16	0·47	0·06	0·53	0·46
9	8	29	1·02	0·49	0·05	0·54	0·53
10	7	31	0·83	0·49	0·07	0·56	0·67
11	8	31	1·09	0·50	0·06	0·56	0·51
12	6	29	0·57	0·32	0·04	0·36	0·63
13	9	37	1·65	0·86	0·10	0·96	0·58
14	6	28	0·55	0·32	0·04	0·36	0·65
15	6	28	0·55	0·33	0·04	0·37	0·67
16	8	32	1·13	0·60	0·06	0·66	0·58
17	7	32	0·86	0·57	0·05	0·62	0·72
18	5	22	0·30	0·14	0·02	0·16	0·53
19	10	41	2·26	1·15	0·08	1·23	0·54
20	5	24	0·34	0·18	0·03	0·21	0·62
21	8	34	1·20	0·56	0·06	0·62	0·52
22	10	35	1·93	0·90	0·06	0·96	0·50
23	8	35	1·23	0·61	0·04	0·65	0·53
24	9	37	1·65	0·75	0·07	0·82	0·50
25	9	33	1·47	0·81	0·09	0·90	0·61
26	8	36	1·27	0·65	0·05	0·70	0·55
27	6	27	0·53	0·31	0·06	0·37	0·70
28	8	35	1·23	0·65	0·08	0·73	0·59
29	9	38	1·70	0·82	0·05	0·87	0·51
30	8	34	1·20	0·79	0·11	0·90	0·75
31	7	31	0·83	0·42	0·07	0·49	0.59
32	7	32	0·86	0·51	0·06	0·57	0·66
33	5	28	0·39	0·22	0·03	0·25	0·64
34	10	38	2·09	1·11	0·15	1·26	0·60
35	10	34	1·87	0·86	0·08	0·94	0·50
36	7	30	0·81	0·53	0·09	0·62	0·77
37	9	34	1·52	0·86	0·13	0·99	0·65
38	10	37	2·04	0·99	0·12	1·11	0·54
39	6	27	0·53	0·31	0·04	0·35	0·66
40	8	30	1·06	0·60	0·04	0·64	0·60
41	7	29	0·78	0·29	0·04	0·33	0·42
42	7	30	0·81	0·39	0·04	0·43	0·53
43	9	38	1·70	0·83	0·06	0·89	0·52
44	7	31	0·83	0·43	0·04	0·47	0·57
45	8	33	1·16	0·67	0·10	0·77	0·66
46	7	33	0·89	0·53	0·09	0·62	0·70
47	9	35	1·56	0·86	0·13	0·99	0·63
48	8	31	1·09	0·74	0·08	0·82	0·75
49	9	35	1·56	0·88	0·12	1·00	0·64
50	10	40	2·21	1·28	0·22	0·50	0·68
Sum	383	1576	54·98	29·21	3·40	32·61	30·18
Mean	...	...	...	...	...	...	0·6036

Form-factor 3,261 ÷ 5498 = 0·5931.

TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT F.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder from Girth at 5 feet.	CUBIC CONTENT OF TREE BY WEIGHING.		True Cubic Content of Tree (5 + 6.)	Form-factor (7 ÷ 4.)
				Wood 72 lb. per Cubic foot.	Twigs and Foliage 200 lb. per Cubic foot.		
1	2	3	4	5	6	7	8
1	8	33	1·16	0·76	0·09	0·85	0·73
2	6	27	0·53	0·28	0·04	0·32	0·60
3	7	33	0·89	0·51	0·05	0·56	0·63
4	9	35	1·56	0·85	0·09	0·94	0·60
5	11	37	2·47	1·32	0·18	1·50	0·61
6	9	33	1·47	0·76	0·16	0·92	0·63
7	8	32	1·13	0·56	0·08	0·64	0·57
8	7	30	0·81	0·47	0·07	0·54	0·67
9	8	30	1·06	0·58	0·11	0·69	0·65
10	9	33	1·47	0·82	0·14	0·96	0·65
11	7	28	0·75	0·40	0·11	0·51	0·67
12	7	26	0·70	0·46	0·07	0·53	0·76
13	7	31	0·83	0·46	0·04	0·50	0·60
14	10	37	2·04	1·04	0·15	1·19	0·58
15	9	35	1·56	0·78	0·08	0·86	0·55
16	9	36	1·61	0·72	0·06	0·78	0·48
17	5	26	0·36	0·22	0·03	0·25	0·69
18	8	28	0·99	0·31	0·06	0·37	0·37
19	5	25	0·35	0·22	0·03	0·25	0·71
20	6	31	0·61	0·42	0·03	0·45	0·74
21	6	27	0·53	0·26	0·04	0·30	0·57
22	7	28	0·75	0·39	0·06	0·45	0·60
23	7	27	0·73	0·35	0·04	0·39	0·53
24	9	33	1·47	0·79	0·09	0·88	0·60
25	9	31	1·38	0·65	0·10	0·75	0·54
26	7	26	0·70	0·33	0·07	0·40	0·57
27	6	27	0·53	0·28	0·05	0·33	0·6[illegible]
28	7	25	0·67	0·32	0·05	0·37	0·5[illegible]
29	9	31	1·38	0·78	0·11	0·89	0·64
30	7	30	0·81	0·42	0·04	0·46	0·57
31	11	38	2·54	1·18	0·15	1·33	0·52
32	6	26	0·51	0·29	0·05	0·34	0·67
33	7	27	0·73	0·46	0·06	0·52	0·71
34	9	33	1·47	0·78	0·11	0·89	0·61
35	7	32	0·86	0·53	0·06	0·59	0·69
36	7	30	0·81	0·54	0·07	0·61	0·75
37	7	29	0·78	0·49	0·07	0·56	0·72
38	8	33	1·16	0·50	0·05	0·55	0·47
39	9	31	1·38	0·78	0·15	0·93	0·67
40	9	26	1·16	0·42	0·05	0·47	0·41
41	6	28	0·55	0·32	0·05	0·37	0·67
42	8	34	1·20	0·67	0·14	0·81	0·68
43	8	30	1·06	0·43	0·06	0·49	0·46
44	7	28	0·75	0·33	0·05	0·38	0·51
45	7	30	0·81	0·51	0·10	0·61	0·75
46	6	25	0·49	0·26	0·03	0·29	0·59

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TUMALAPENTA PLANTATION—(*Continued*).

SAMPLE PLOT F—(*Continued*).

Calculation of Form-factor—(Continued).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content of Tree by weighing.		True Cubic Content of Tree (5 + 6.)	Form factor (7 ÷ 4.)
				Wood 72 lb. per Cubic foot.	Twigs and Foliage 200 lb. per Cubic foot.		
1	2	3	4	5	6	7	8
47	9	32	1·43	0·72	0·11	0·83	0·58
48	9	33	1·47	0·83	0·10	0·93	0·63
49	8	28	0·99	0·54	0·09	0·63	0·64
50	9	34	1·52	0·79	0·13	0·92	0·61
Sum ...	386	1,518	52·97	27·88	4·02	31·88	30·62
Mean ...	7·72	30·36	1·059	0·557	0·80	0·637	0·612

Form-factor 31·88 ÷ 52·97 = 0·60185.

TAMINAPATNAM PLANTATION.

Plot A.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Total Height of Tree.	Ideal Cylinder from girth at 5 feet.	Cubic Content from 10 feet section of stem.	Cubic Content of Top by Weighing. Branch-wood at 70 lb. per Cubic Foot.	Cubic Content of Top by Weighing. Twigs and Foliage at 200 lb. per Cubic Foot.	True Cubic Content of Tree (5 + 6)	Form-factor (7 ÷ 4)
1	2	3	4	5	6	7	8	9
1 ...	7	41	1·11	...	0·61	0·07	0·68	0·61
2 ...	9	42	1·88	...	1·03	0·10	1·13	0·60
3 ...	8	36	1·27	...	0·70	0·12	0·82	0·65
4 ...	9	39	1·74	...	1·01	0·14	1·15	0·66
5 ...	7¾	36	1·20	...	0·81	0·07	0·88	0·73
6 ...	10	42	2·32	...	1·69	0·12	1·81	0·78
7 ...	8	39	1·37	...	0·87	0·09	0·96	0·70
8 ...	7	38	1·02	...	0·70	0·07	0·77	0·75
9 ...	6	28	0·55	...	0·26	0·04	0·30	0·55
10 ...	7	33	0·89	...	0·53	0·06	0·59	0·66
11 ...	9	39	1·74	...	0·93	0·09	1·02	0·59
12 ...	8	36	1·27	...	0·71	0·06	0·77	0·61
13 ...	9	39	1·74	...	0·77	0·06	0·83	0·48
14 ...	5¾	27	0·49	...	0·21	0·03	0·24	0·49
15 ...	6	31	0·61	...	0·31	0·04	0·35	0·57
16 ...	6	36	0·71	...	0·41	0·04	0·45	0·63
17 ...	7¼	34	0·99	...	0·46	0·03	0·49	0·49
18 ...	7¼	40	1·16	...	0·63	0·06	0·69	0·59
19 ...	7	36	0·97	...	0·57	0·06	0·63	0·65
20 ...	8	37	1·30	...	0·70	0·06	0·76	0·58
21 ...	11¼	44	3·08	...	1·50	0·16	1·66	0·54
22 ...	5	33	0·45	...	0·19	0·02	0·21	0·47
23 ...	6¼	31	0·67	...	0·34	0·03	0·37	0·55
24 ...	6½	33	0·77	...	0·39	0·03	0·42	0·55
25 ...	5¼	26	0·40	...	0·19	0·02	0·21	0·53
26 ...	6	28	0·55	...	0·31	0·04	0·35	0·64
27 ...	5	25	0·35	...	0·21	0·02	0·23	0·66
28 ...	9½	39	1·95	...	0·89	0·09	0·98	0·50
29 ...	6	31	0·61	...	0·30	0·03	0·33	0·54
30 ...	11¾	37	2·82	...	1·63	0·14	1·77	0·63
31 ...	6¼	34	0·74	...	0·41	0·05	0·46	0·62
32 ...	13¼	47	4·56	...	2·47	0·27	2·74	0·60
33 ...	6¼	32	0·69	...	0·44	0·05	0·49	0·71
34 ...	17¾	55	9·58	...	4·63	0·43	5·06	0·53
35 ...	8¼	38	1·43	...	0·80	0·07	0·87	0·61
36 ...	7	36	0·97	...	0·70	0·06	0·76	0·78
37 ...	8¾	40	1·69	...	0·67	0·11	0·78	0·46
38 ...	5	25	0·35	...	0·20	0·03	0·23	0·66
39 ...	4¾	29	0·36	...	0·20	0·02	0·22	0·61
40 ...	9½	40	1·99	...	1·16	0·15	1·31	0·66
41 ...	13¼	48	4·66	...	2·73	0·19	2·92	0·63
42 ...	10¼	42	2·44	...	1·50	0·20	1·70	0·70
43 ...	5½	34	0·57	...	0·37	0·04	0·41	0·72
44 ...	8¼	39	1·47	...	0·80	0·08	0·88	0·60
45 ...	7	37	1·00	...	0·57	0·06	0·63	0·63
46 ...	6	35	0·69	...	0·44	0·03	0·47	0·68
47 ...	8	42	1·48	...	0·84	0·06	0·90	0·61
48 ...	7¼	37	1·08	...	0·63	0·04	0·67	0·62
49 ...	5½	30	0·50	...	0·19	0·03	0·22	0·44
50 ...	4⅓	26	0·29	...	0·17	0·02	0·19	0·66
51 ...	5	29	0·40	...	0·27	0·02	0·29	0·73

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TAMINAPATNAM PLANTATION—(*Continued*).

PLOT A—(*Continued*).

Calculation of Form-factor—(Continued).

Number of Tree.	Girth at 5 feet.	Total Height of Tree.	Ideal Cylinder from girth at 5 feet.	Cubic Content from 10 feet section of stem.	Cubic Content of Top by Weighing.		True Cubic Content of Tree (5 + 6)	Form-factor (9 ÷ 6)
					Branch-wood at 70 lb. per Cubic Foot.	Twigs and Foliage at 200 lb. per Cubic Foot.		
52 ...	6½	32	0·69	...	0·29	0·02	0·31	0·45
53 ...	8	37	1·30	...	0·79	0·04	0·83	0·64
54 ...	6	29	0·57	...	0·31	0·03	0·34	0·60
55 ...	11	42	2·80	...	1·33	0·13	1·46	0·52
56 ...	10	43	2·37	...	1·63	0·17	1·80	0·76
57 ...	5	31	0·43	...	0·29	0·03	0·32	0·74
58 ...	6	29	0·57	...	0·30	0·06	0·36	0·63
59 ...	9¼	39	1·85	...	1·06	0·10	1·16	0·63
60 ...	6½	31	0·72	...	0·43	0·05	0·48	0·67
Total ...	459¾	2144	84·22	...	46·48	4·63	51·11	36·88
Mean ...	...	...	...	...	...	...	...	·6146

Form-factor 51·11 ÷ 84·22 = ·6069.

TAMINAPATNAM PLANTATION—(*Continued*).

SAMPLE PLOT B.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Total Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content of Stem from 10 feet Sections.	CUBIC CONTENT OF TOP AND BRANCHES BY WEIGHING.		True Content of Tree 5 + 6.	Form-factor 7 ÷ 4.
	\				Branch-wood at 70 lb. per Cubic Foot.	Twigs and Foliage at 200 lb. per Cubic Foot.		
1 ...	17	62	9·90	4·17	1·11	0·43	5·71	0·58
2 ...	10	43	2·37	0·90	0·27	0·10	1·27	0·54
3 ...	12	53	4·21	1·69	0·44	0·11	2·24	0·53
4 ...	10¼	47	2·73	0·88	0·21	0·09	1·18	0·43
5 ...	14	45	4·87	1·62	0·26	0·15	2·03	0·42
6 ...	11¼	47	3·29	1·56	0·50	0·14	2·20	0·67
7 ...	11¼	45	3·15	1·29	0·20	0·11	1·60	0·51
8 ...	13½	51	5·14	2·54	0·39	0·24	3·17	0·62
9 ...	10½	45	2·74	1·26	0·27	0·10	1·63	0·59
10 ...	10½	45	2·74	1·26	0·21	0·11	1·58	0·58
11 ...	15½	58	7·70	3·32	0·53	0·34	4·19	0·54
12 ...	9¾	49	2·58	1·31	0·09	0·15	1·55	0·60
13 ...	9¼	42	1·99	0·90	0·19	0·08	1·17	0·59
14 ...	10½	45	2·74	1·26	0·33	0·13	1·72	0·63
15 ...	9½	41	2·04	1·09	0·16	0·11	1·36	0·67
16 ...	8¾	38	1·61	0·85	0·14	0·10	1·09	0·68
17 ...	5¾	31	0·57	0·28	0·04	0·04	0·36	0·63
18 ...	9	48	2·14	1·20	0·10	0·08	1·38	0·64
19 ...	12½	51	4·40	2·08	0·19	0·21	2·48	0·56
20 ...	13¾	52	5·43	2·69	0·31	0·24	3·24	0·60
21 ...	12	50	3·97	1·83	0·21	0·15	2·19	0·55
22 ...	10¼	50	2·90	...	1·81	0·11	1·92	0·66
23 ...	11¾	47	3·59	...	1·84	0·15	1·99	0·55
24 ...	9¾	48	2·52	...	1·43	0·09	1·52	0·60
25 ...	9½	51	2·54	1·17	0·27	0·09	1·53	0·60
26 ...	7¼	44	1·28	0·55	0·13	0·04	0·72	0·56
27 ...	12	53	4·21	2·16	0·30	0·14	2·60	0·62
28 ...	8	41	1·45	0·54	0·27	0·07	0·88	0·61
29 ...	8½	41	1·64	0·71	0·31	0·07	1·09	0·67
30 ...	13¾	48	5·02	2·18	0·57	0·28	3·03	0·60
31 ...	11½	48	3·51	1·80	0·41	0·16	2·37	0·68
32 ...	13	46	4·29	2·27	0·61	0·27	3·15	0·73
33 ...	10½	47	2·86	1·37	0·29	0·13	1·79	0·63
34 ...	6¼	32	0·69	0·33	0·04	0·04	0·41	0·59
35 ...	9½	45	2·24	1·09	0·17	0·10	1·36	0·61
36 ...	5½	29	0·48	...	0·24	0·03	0·27	0·56
37 ...	6½	32	0·75	0·41	0·10	0·05	0·56	0·75
38 ...	5½	27	0·45	...	0·31	0·04	0·35	0·78
39 ...	7½	34	1·06	0·49	0·11	0·08	0·68	0·64
40 ...	7	28	0·75	0·41	0·11	0·07	0·59	0·79
41 ...	10	38	2·09	1·04	0·13	0·04	1·21	0·58
42 ...	12½	49	4·23	1·97	0·30	0·22	2·49	0·59
43 ...	10½	43	2·62	...	1·37	0·10	1·47	0·56
44 ...	10	45	2·48	...	1·51	0·16	1·67	0·67
45 ...	6	28	0·55	...	0·40	0·03	0·43	0·78
46 ...	9	35	1·56	0·72	0·04	0·09	0·85	0·54
47 ...	6	38	0·75	...	0·43	0·02	0·45	0·60
48 ...	7	40	1·08	...	0·67	0·02	0·69	0·64
49 ...	6	28	0·55	...	0·27	0·03	0·30	0·55
50 ...	6	33	0·65	...	0·34	0·02	0·36	0·55
51 ...	7	29	0·78	...	0·39	0·04	0·43	0·55

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TAMINAPATNAM PLANTATION—(*Continued*).

SAMPLE PLOT B—(*Continued*).

Calculation of Form-factor—(Continued).

Number of Tree.	Girth at 5 feet.	Total Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content of Stem from 10 feet Sections.	Cubic Content of Top and Branches by Weighing.		True Content of Tree 5 + 6.	Form-factor 7 ÷ 4.
					Branch-wood at 70 lb. per Cubic Foot.	Twigs and Foliage at 200 lb. per Cubic Foot.		
52 ...	7	36	0·97	...	0·44	0·03	0·47	0·48
53 ...	9½	31	1·55	...	1·07	0·11	1·18	0·76
54 ...	8½	47	1·88	...	1·07	0·06	1·13	0·60
55 ...	9½	44	2·19	1·09	0·16	0·11	1·36	0·62
56 ...	7¾	37	1·23	0·54	0·13	0·06	0·73	0·59
57 ...	6	34	0·67	0·33	0·04	0·03	0·40	0·60
58 ...	9	40	1·79	0·93	0·11	0·11	1·15	0·64
59 ..	8½	32	1·28	0·58	0·21	0·09	0·88	0·70
60 ...	8¾	34	1·44	0·71	0·20	0·16	1·07	0·74
Total ...	574½	2,520	148·88	57·37	24·75	6·75	88·87	36·73
Mean ...	...	...	...	...	...	...	...	0·6121

Form-factor = 88·87 ÷ 148·88 = ·597.

KOTTAPATAM PLANTATION.

SAMPLE PLOT A.

Calculation of Form-factor.

Number of Tree.		Girth at 5 feet.	Total Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content from 10 feet Sections of Stem.	Cubic Content of Top by Weighing.		True Cubic Content of Tree 5 + 6.	Form-factor 7 ÷ 4.
						Branch-wood at 70 lb. per Cubic Foot.	Twigs and Foliage at 200 lb. per Cubic Foot.		
1	...	12¾	47	4·22	2·03	0·56	0·16	2·75	0·65
2	...	17¼	72	11·84	4·77	1·03	0·27	6·07	0·51
3	...	8½	47	1·88	0·98	0·19	0·06	1·23	0·65
4	...	8	44	1·55	0·76	0·11	0·07	0·94	0·61
5	...	10¾	56	3·58	1·83	0·24	0·09	2·16	0·60
6	...	10¼	44	2·56	1·34	0·19	0·09	1·62	0·63
7	...	8½	45	1·80	0·90	0·11	0·07	1·08	0·60
8	...	6¼	35	0·76	0·33	0·10	0·04	0·47	0·62
9	...	15¾	57	7·82	3·16	1·00	0·25	4·41	0·56
10	...	15¼	62	7·97	2·87	1·13	0·22	4·22	0·53
11	...	7½	42	1·31	0·68	0·09	0·04	0·81	0·62
12	...	11	48	3·20	1·37	0·21	0·15	1·73	0·54
13	..	12	54	4·29	1·88	0·13	0·17	2·18	0·51
14	...	12¾	54	4·85	2·30	0·26	0·16	2·72	0·56
15	...	16	64	9·05	4·10	0·50	0·34	4·94	0·55
16	...	9	47	2·10	0·98	0·18	0·05	1·21	0·58
17	...	13¼	52	5·05	2·30	0·26	0·18	2·74	0·54
18	...	12	46	3·66	1·50	0·25	0·11	1·86	0·51
19	...	6	35	0·69	0·28	0·06	0·02	0·36	0·52
20	...	7	45	1·21	0·60	0·06	0·03	0·69	0·57
21	..	8½	44	1·76	0·76	0·07	0·07	0·90	0·51
22	...	12½	56	4·84	2·05	0·31	0·16	2·52	0·52
23	...	13¾	58	6·06	3·05	0·21	0·17	3·43	0·57
24	...	10	41	2·26	1·09	0·09	0·10	1·28	0·57
25	...	7½	40	1·24	0·46	0·13	0·03	0·62	0·50
26	...	7	40	1·08	0·46	0·13	0·04	0·63	0·58
27	...	16¾	60	9·30	4·31	0·70	0·28	5·29	0.57
28	...	14¾	57	6·86	2·83	1·13	0·25	4·21	0·61
29	...	12	51	4·05	1·88	0·30	0·19	2·37	0·59
30	...	10¼	53	3·08	1·45	0·17	0·11	1·73	0·56
31	...	8¼	43	1·62	0·62	0·30	0·11	1·03	0·64
32	...	14	56	6·06	2·45	0·61	0·13	3·19	0·53
33	...	11¼	43	3·01	1·29	0·46	0·17	1·92	0·64
34	...	10	50	2·76	1·09	0·26	0·04	1·39	0·50
35	...	9	44	1·96	0·85	0·17	0·07	1·09	0·56
36	...	10¼	42	2·44	1·18	0·20	0·14	1·52	0·62
37	...	14	55	5·95	2·58	0·40	0·22	3·20	0·54
38	...	6½	37	0·86	0·46	0·14	0·03	0·63	0·73
39	...	12	63	5·01	2·16	0·43	0·09	2·68	0·53
40	...	12	57	4·53	1·88	0·36	0·13	2·37	0·52
41	...	9	45	2·01	0·98	0·11	0·08	1·17	0·58
42	..	15¼	57	7·33	3·23	0·91	0·30	4·44	0·61
43	...	7¼	41	1·19	0·55	0·10	0·04	0·69	0·58
44	...	12	58	4·61	2·24	0·33	0·14	2·71	0·59
45	...	9½	48	2·39	1·17	0·24	0·07	1·48	0·62
46	...	10½	47	2·86	1·51	0·11	0·09	1·71	0·60
47	...	8½	42	1·68	0·85	0·13	0·09	1·07	0·64
48	...	11½	51	3·73	1·88	0·29	0·17	2·34	0·63
49	...	7¾	43	1·43	0·68	0·07	0·07	0·82	0·57
50	...	11	48	3·20	1·45	0·39	0·12	1·96	0·61
Sum	...	542¼	2466	184·55	82·40	15·91	6·27	104·58	28·88
Mean	...	...	...	...	...	...	...	...	0·5776

Form-factor 104·58 ÷ 184·55 = 0·56667.

KOTTAPATAM PLANTATION—(*Continued*).

SAMPLE PLOT B.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Total Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content from 10 feet Section of Stem.	Cubic Content of Top by weighing. Branch wood at 70 lb. per Cubic Foot.	Cubic Content of Top by weighing. Twigs and Foliage at 200 lb. per Cubic Foot.	True Cubic Content of Tree (5 + 6).	Form-factor 7 ÷ 4.
1	2	3	4	5	6		7	8
1 ...	8¾	40	1·69	0·85	0·09	0·05	0·99	0·59
2 ...	5	27	03·7	...	0·21	0·04	0·25	0·68
3 ...	7	36	0·97	...	0·51	0·07	0·58	0·60
4 ...	6	29	0·57	...	0·39	0·04	0·43	0·75
5 ...	10	52	2·87	1·48	0·14	0·09	1·71	0·60
6 ...	8¾	44	1·86	0·98	0·17	0·09	1·24	0·67
7 ...	15½	49	6·51	2·89	0·43	0·15	3·47	0·53
8 ...	9¼	50	2·37	1·06	0·27	0·10	1·43	0·60
9 ...	9	43	1·92	0·85	0·09	0·09	1·03	0·54
10 ...	11½	46	3·36	1·83	0·10	0·18	2·11	0·63
11 ...	11	49	3·27	1·59	0·09	0·17	1·85	0·57
12 ...	7	39	1·05	0·46	0·11	0·05	0·62	0·59
13 ...	6¾	33	0·83	0·41	0·10	0·05	0·56	0·67
14 ...	10	44	2·43	1·09	0·14	0·12	1·35	0·56
15 ...	16¾	61	9·46	4·09	0·59	0·39	5·07	0·54
16 ...	7¾	46	1·53	0·68	0·11	0·05	0·84	0·55
17 ...	10	49	2·70	1·40	0·13	0·12	1·65	0·61
18 ...	7¼	34	0·99	...	0·51	0·07	0·58	0·59
19 ...	10	51	2·81	1·40	0·07	0·14	1·61	0·57
20 ...	10	46	2·54	1·09	0·17	0·06	1·32	0·52
21 ...	15½	56	7·43	3·35	0·63	0·29	4·27	0·57
22 ...	10	45	2·48	1·17	0·21	0·12	1·50	0·60
23 ...	11¾	56	4·27	2·05	0·19	0·15	2·39	0·56
24 ...	7¼	39	1·13	0·46	0·13	0·06	0·65	0·58
25 ...	8½	38	1·52	0·63	0·11	0·03	0·77	0·51
26 ...	6½	34	0·79	0·41	0·10	0·04	0·55	0·70
27 ...	7¼	31	0·90	0·41	0·09	0·12	0·62	0·69
28 ...	16	51	7·21	3·24	0·43	0·19	3·86	0·54
29 ...	10	47	2·59	1·17	0·19	0·08	1·44	0·56
30 ...	6¼	34	0·74	0·33	0·06	0·03	0·42	0·57
31 ...	8	42	1·48	0·76	0·19	0·10	1·05	0·71
32 ...	11	43	2·87	1·29	0·36	0·16	1·81	0·63
33 ...	5	30	0·41	...	0·22	0·02	0·24	0·59
34 ...	9½	36	1·80	0·74	0·12	0·07	0·94	0·52
35 ...	8¾	45	1·91	0·85	0·13	0·07	1·05	0·55
36 ...	13	56	5·23	2·11	0·30	0·20	2·61	0·50
37 ...	5¾	31	0·57	0·28	0·03	0·03	0·34	0·60
38 ...	12	54	4·29	1·97	0·27	0·19	2·43	0·57
39 ...	9	47	2·10	0·98	0·13	0·05	1·16	0·55
40 ...	9¼	48	2·27	0·98	0·20	0·09	1·27	0·56
41 ...	11	49	3·27	1·37	0·34	0·17	1·88	0·57
42 ...	8½	44	1·76	0·98	0·16	0·09	1·23	0·70
43 ...	11	56	3·74	1·84	0·29	0·10	2·23	0·60
44 ...	8¾	39	1·65	0·85	0·07	0·08	1·00	0·61
45 ...	8	45	1·59	0·76	0·10	0·05	0·91	0·57
46 ...	6½	32	0·75	0·41	0·09	0·05	0·55	0·73
47 ...	8¼	38	1·43	0·76	0·06	0·06	0·88	0·62
48 ...	10½	43	2·62	1·20	0·16	0·09	1·45	0·55
49 ...	7½	39	1·21	0·68	0·04	0·07	0·79	0·65
50 ...	10½	48	2·92	1·34	0·06	0·10	1·50	0·51
Total ...	468	2,164	123·03	55·52	9·88	5·07	70·47	29·73
Mean ...	...	...	...	...	...	...	...	0·5946

Form-factor = 70·47 ÷ 123·03 = 0·57278.

KOTTAPATAM PLANTATION—(*Continued*).

PLOT C.

Margin Trees planted by Fishermen.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	2	3	4	1	2	3	4
1	38	70	55·85	34	34	57	36·41
2	38	62	49·47	35	23	59	17·24
3	42	62	60·43	36	29	65	30·20
4	25	62	21·41	37	25	61	21·06
5	28	59	25·56	38	{ 28	62	26·86
6	35	62	41·97		{ 24	63	20·05
7	28	57	24·69	39	27	59	23·76
8	29	65	30·20	40	28	58	25·12
9	23	62	18·12	41	28	61	26·42
10	34	62	39·60	42	27	59	23·76
11	30	62	30·83	43	24	58	18·46
12	32	62	35·08	44	27	55	22·15
13	43	55	56·19	45	23	55	16·07
14	27	55	22·15	46	30	60	29·84
15	22	52	13·90	47	24	63	20·05
16	33	63	37·91	48	23	58	16·95
17	32	59	33·38	49	21	59	14·37
18	38	69	55·06	50	29	55	25·56
19	37	66	49·93	51	20	59	13·04
20	29	51	23·70	52	23	54	15·78
21	28	64	27·72	53	23	54	15·78
22	28	58	25·12	54	25	45	15·54
23	22	45	12·03	55	20	52	11·49
24	26	55	20·54	56	20	47	10·38
25	25	56	19·34				
26	24	59	18·78				
27	26	66	24·65	Total ...	1,595	3,358	1528·16
28	25	56	19·34				
29	32	61	34·51	Average ...	28·48	59·96	27·29
30	27	60	24·17				
31	27	60	24·17	Maximum ...	43	70	60·43
32	26	59	22·04				
33	31	64	33·98	Minimum ...	20	45	10·38

Average growth.

$$\text{The Individual-increment} = \frac{1528{\cdot}16 \times 0{\cdot}57}{56 \times 10} = 1{\cdot}55549 \text{ cubic ft.}$$

$$i.e., \frac{\text{Ideal-cylinders} \times \text{Form-factor.}}{\text{No. of trees} \times \text{Age of trees.}}$$

KOTTAPATAM PLANTATION—(*Continued*).

Sample Trees.

Calculation of Form-factor.

Number of Tree.	Girth at 5 feet.	Total Height of Tree.	Ideal Cylinder from Girth at 5 feet.	Cubic Content of Stem from 10 feet Sections.	Cubic Content of Top and Branches by weighing.		True Cubic Content of Tree 5 + 6.	Form-factor 7 ÷ 4.
					Branch wood at 70 lb. per Cubic Foot.	Twigs and Foliage at 200 lb. per Cubic Foot.		
1	2	3	4	5	6		7	8
1 ...	33	62	37·31	14·85	5·43	2·38	22·66	0·61
2 ...	26	58	21·66	8·61	2·21	1·05	11·87	0·55
3 ...	25	60	20·72	8·11	3·91	0·98	13·00	0·63
4 ...	29	58	26·95	10·25	6·09	1·29	17·63	0·65
5 ...	36	69	49·41	16·51	7·61	2·44	26·56	0·54
6 ...	21	59	14·37	5·46	2·90	0·50	8·86	0·62
7 ...	19	61	12·16	4·66	2·43	0·26	7·35	0·60
8 ...	25	60	20·72	7·73	1·91	0·88	10·52	0·51
9 ...	20	56	12·37	4 46	1·70	0·36	6·52	0·53
10 ...	23	61	17·83	6·96	1·39	0·75	9·10	0·51
Sum ...	257	604	233·50	87·60	35·58	10·89	134·07	5·75
Mean ...	25·7	60·4	23·35	8·76	3·56	1·09	13·41	0·575

Form-factor 134·07 ÷ 233·50 = 0·57417.

DUGARAZPATNAM PLANTATION.

Plot A.

A small piece 0·0322 Acre in a Private Plantation.

Trees three years old, growing on manured wet land. Measured on account of the fine appearance of the growth.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	2	3	4	1	2	3	4
1	9	30	1·34	24	8	30	1·06
2	8	29	1·02	25	5	20	0·27
3	9	30	1·34	26	6	30	0·59
4	10	33	1·82	27	5	24	0·34
5	7	26	0·70	28	9	31	1·38
6	9	30	1·34	29	8	29	1·02
7	3	12	0·06	30	7	29	0·78
8	9	27	1·20	31	7	30	0·81
9	6	26	0·51	32	8	34	1·20
10	9	34	1·52	33	8	30	1·06
11	13	36	3·36	34	8	31	1·09
12	12	35	2·78	35	9	30	1·34
13	6	25	0·49	36	6	26	0·51
14	9	33	1·47	37	8	30	1·06
15	4	21	0·18	38	6	21	0·41
16	9	30	1·34				
17	7	27	0·73	Total ...	291	1,083	39·50
18	6	26	0·51				
19	6	25	0·49	Average ...	7·66	28·50	1·04
20	8	33	1·16				
21	9	31	1·38	Maximum ...	13	36	3·36
22	8	30	1·06				
23	7	29	0·78	Minimum ...	3	12	0·06

DUGARAZPATNAM PLANTATION—(*Continued*).

Plot A—(*Continued*).

Calculation of Results.

The factor used is 0·60 obtained from planting at this distance and one year older at Tumalapenta F. Sample-area.

Total stock on Sample-area 39·50 × 0·60 = 23·70 cubic feet.
Stock per acre = 23·70 ÷ 0·0322 = 736·02 cubic feet.
Total number of trees on Sample-area is 38.
Do. do. per acre 38 ÷ 0·0322 = 1180·12 trees.
Actual stock on the ground per acre is 736·02 c. ft. in 1180·12 trees.

Yearly Individual-increment 736·02 cubic feet ÷ 1180·12 trees ÷ 3 years = 0·20789.

Blanks and Thinnings.

There have been no thinnings, and there are no blanks.

$$\text{Yearly Acre-increment} = \frac{\text{Actual stock} + \text{Blanks} + \text{Thinnings}}{\text{Present Age}}$$

$$= \frac{736{\cdot}02 + 0{\cdot}0 + 0{\cdot}0}{3} = 245{\cdot}34 \text{ c. ft.}$$

or (at 45 c. ft. per ton) 5·452 tons.

DUGARAZPATNAM PLANTATION—(*Continued*).

Isolated Trees on Buckingham Canal, 3 Miles South of Dugarázpatnam, 20 Years of Age, originally planted 15 × 15 one Row, now many Gaps.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	2	3	4	1	2	3	4
1	49	64	84·91	36	29	50	23·23
2	45	63	70·50	37	35	58	39·26
3	57	61	109·52	38	42	45	43·86
4	44	66	70·61	39	49	53	70·32
5	60	64	127·32	40	35	55	37·23
6	57	63	113·11	41	40	51	45·09
7	50	49	67·69	42	43	43	43·93
8	31	50	26·55	43	42	53	51·66
9	53	50	77·61	44	49	53	70·32
10	31	44	23·36	45	57	55	98·75
11	42	54	52·64	46	43	52	53·13
12	40	46	40·67	47	57	65	116·70
13	37	57	43·12	48	40	58	51·28
14	34	50	31·94	49	38	48	38·30
15	39	50	42·02	50	41	57	52·95
16	34	49	31·30	51	38	45	35·90
17	32	46	26·03	52	42	56	54·58
18	37	49	37·07	53	43	57	58·24
19	37	52	39·34	54	33	55	33·09
20	37	50	37·82	55	28	50	21·66
21	30	55	27·35	56	47	58	70·80
22	42	65	63·36	57	29	58	26·95
23	45	62	69·38	58	36	60	42·97
24	55	67	112·00	59	29	48	22·30
25	55	61	101·97	60	44	65	69·54
26	45	56	62·66	61	43	61	62·32
27	30	45	22·38	62	35	49	33·17
28	38	54	43·09	63	38	45	35·90
29	46	64	74·83	64	44	46	49·21
30	42	62	60·43	65	35	45	30·46
31	33	61	36·71	66	36	44	31·51
32	49	66	87·57	67	31	54	28·67
33	32	47	26·59	68	39	62	52·11
34	48	68	86·58	69	50	58	80·12
35	37	66	49·93	70	32	37	20·93

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Isolated Trees on Buckingham Canal, 3 Miles South of Dugarázpatnam, 20 Years of Age, originally planted 15 × 15 one Row, now many Gaps.—(Continued).

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	2	3	4	1	2	3	4
71	31	50	26·55	134	29	47	21·84
72	25	38	13·12	135	48	75	95·49
73	30	41	20·39	136	46	49	57·29
74	35	51	34·52	137	34	41	26·19
75	38	43	34·31	138	49	63	83·59
76	33	44	26·47	139	32	34	19·24
77	48	58	73·84	140	30	51	25·36
78	43	63	64·37	141	39	58	48·75
79	34	60	38·32	142	47	77	93·99
80	23	47	13·73	143	44	51	54·56
81	33	57	34·30	144	30	55	27·35
82	29	53	24·63	145	37	50	37·82
83	38	57	45·48	146	25	43	14·85
84	26	38	14·19	147	39	61	51·27
85	25	49	16·92	148	43	51	52·11
86	37	46	34·80	149	39	54	45·38
87	30	45	22·38	150	41	50	46·44
88	36	47	33·66	151	51	56	80·49
89	32	42	23·76	152	29	48	22·30
90	40	46	40·67	153	51	57	81·93
91	38	42	33·51	154	40	59	52·16
92	33	58	34·90	155	33	60	36·10
93	39	58	48·75	156	34	58	37·05
94	30	59	29·34	157	26	53	19·79
95	23	44	12·86	158	28	56	24·26
96	47	60	73·24	159	36	40	28·64
97	26	40	14·94	160	36	75	53·71
98	34	40	25·55	161	25	43	14·85
99	38	46	36·70	162	32	46	26·03
100	40	50	44·20	163	29	45	20·91
101	27	40	16·11	164	25	35	12·08
102	35	50	33·84	165	20	50	11·05
103	29	48	22·30	166	45	47	52·59
104	24	52	16·55	167	58	65	120·83
105	31	53	28·14	168	38	68	54·26
106	34	50	31·94	169	43	78	79·70
107	47	52	63·47	170	36	60	42·97
108	50	51	70·45	171	39	59	49·59
109	31	50	26·55	172	24	43	13·68
110	32	56	31·68	173	21	53	12·91
111	45	60	67·14	174	39	63	52·95
112	31	38	20·18	175	30	56	27·85
113	39	62	52·11	176	39	60	50·43
114	47	61	74·46	177	28	30	12·99
115	40	60	53·05	178	41	54	50·16
116	41	57	52·95	179	25	40	13·81
117	39	60	50·43	180	21	58	14·13
118	37	58	43·87	181	27	48	19·33
119	39	59	49·59	182	46	78	91·20
120	30	58	28·84	183	40	56	49·51
121	32	41	23·20	184	25	46	15·88
122	26	60	22·41	185	58	83	154·29
123	30	60	29·84	186	36	56	40·10
124	26	40	14·94	187	28	42	18·19
125	55	49	81·91	188	49	85	112·78
126	38	50	39·89	189	42	73	71·16
127	41	78	72·45	Total ...	952	1,531	1265·33
128	38	63	50·27				
129	68	72	183·98	Average ...	38·01	48·74	47·36
130	71	61	169·93				
131	37	62	46·90	Maximum ...	71	85	183·98
132	34	50	31·94				
133	35	61	41·29	Minimum ...	20	30	11·05

Average growth.

$$\text{Individual-increment} = \frac{\text{Ideal-cylinders} \times \text{Form-factor}}{\text{No. of trees} \times \text{Age}} = \frac{8951{\cdot}56 \times 0{\cdot}50}{189 \times 20} = 1{\cdot}18406.$$

Isolated Casuarinas growing in a Row by the side of the Buckingham Canal and of the Pulicat Lake at Sriharikót.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	59	60	115·42	26	57	92	165·18
2	65	70	163·43	27	53	88	136·60
3	58	73	135·70	28	46	68	79·51
4	51	76	109·24	29	59	71	136·58
5	66	57	137·21	30	60	70	139·26
6	52	68	101·61	31	61	62	103·49
7	53	74	114·87	32	51	72	103·49
8	52	72	107·58	33	44	68	72·75
9	58	67	124·55	34	46	65	76·00
10	49	63	83·59	35	60	75	149·20
11	55	83	138·74	36	76	80	255·36
12	50	60	82·89	37	62	90	191·19
13	49	65	86·24	38	69	94	247·32
14	74	97	293·54	39	60	89	177·06
15	47	71	86·67	40	51	85	122·17
16	70	92	249·12	41	62	98	208 18
17	71	90	250·72				
18	44	85	90·93				
19	46	86	100·56	Total ...	2,333	31·92	5899·94
20	54	89	143·41				
21	62	84	178·44	Average ...	56·90	77·85	143·90
22	61	80	161·50				
23	57	82	147·22	Maximum ..	76	99	293·54
24	63	99	217·14				
25	50	82	113·28	Minimum ...	44	57	72·75

Average growth.

$$\text{Individual-increment} = \frac{\text{Ideal-cylinders} \times \text{Form-factor}}{\text{No. of trees} \times \text{Age of trees}} = \frac{5899·94 \times 0·50}{41 \times 20} = 3·60 \text{ cubic feet.}$$

The Form-factor is here assumed at 0·50. In the ten years' old margin trees at Kottapatam C it is 0·57; in the 17 years' old isolated trees at Kistnapatam it was assumed at 0·55.

Isolated Casuarina Trees at Kistnapatam Plantation stated by the Salt Department to be 19·3 Years of Age.

Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.	Number of Tree.	Girth at 5 feet.	Height of Tree.	Ideal Cylinder.
1	46	63	73·66	10	43	71	72·54
2	40	66	58·35				
3	48	60	76·39	Sum ...	447	662	732·87
4	39	67	56·31				
5	39	67	56·31	Average ...	44·70	66·20	73·29
6	43	78	79·70				
7	51	67	96·30	Maximum ...	52	78	96·30
8	46	63	73·66				
9	52	60	89·65	Minimum ...	39	60	56·31

$$\text{Individual-increment taking the Form-factor at } 0·55 = \frac{73·29 \times 0·55}{19·3} = 2\ 08857 \text{ cubic feet.}$$

Statement of Casuarina Plantations with Extent, Number of Trees, &c., in Nellore District.

Name of the Village or Plantations.	Extent.	Number of Trees.	When planted.	Amount of Estimate.	Actual Expenditure up to 31st December 1882.	Distance at which the Trees are planted.	Remarks.
1	2	3	4	5	6	7	8
Gúdúr Taluk.	A. C.			RS. A. P.	RS. A. P.		
Taminapatam 1st Plantation.	60 0	30,000	1st Dec. 1873.	7,711 8 0	7,681 2 6	4½ feet apart.	The first plantation was at first planted at 9 feet apart, but this having been objected to by the Collector, intermediate trees at 4½ feet apart were interplanted under the Collector's Order, No. 951, dated 8th May 1874. The same order was followed in planting the 2nd and 3rd plantations in all the villages of the principal division.
Do. Additional Plantation.	...*	90,000	1st Jan. 1875.	6,000 0 0	4,418 2 6		
Do. 2nd Plantation.	50 0	60,000	1st Feb. "	9,593 1 2	9,593 0 5	4½ "	
Do. 3rd do. ...	60 0	56,000	20th Oct. "	7,878 3 0	7,878 0 6	4½ "	
Do. 4th do. ...	60 0	30,000	12th Dec. 1880.	7,822 7 2	2,098 7 11	9 "	
Do. 5th do. ...	160 0	80,000	1st Nov. 1881.	11,087 0 0	2,564 13 5	9 "	
Total ...	390 0	346,000	...	50,092 3 4	34,233 11 3	...	
Kottapatam 1st Plantation ...	30 0	15,000	5th Dec. 1873.	4,040 0 0	3,961 7 2	4½ feet apart.	2. A question having arisen in 1877 as to the distance at which trees should be planted, the Conservator of Forests advised to plant them at 6 feet apart, *vide* his letter, No. 978, 13th November 1877, and this advice was followed in regard to plantations formed in 1878.
Do. Additional Plantation.	...†	45,000	1st Jan. 1875.	2,043 3 6	2,043 3 6		
Do. 2nd Plantation.	30 0	50,000	1st Feb. "	6,554 15 3	6,526 2 9	4½ "	
Do. 3rd do. ...	40 0	40,000	17th Oct. "	6,306 12 7	6,187 4 0	4½ "	
Do. 4th do. ...	50 0	30,000	4th Dec. 1880.	7,798 10 3	1,795 15 5	9 "	
Do. 5th do. ...	140 0	80,000	1st Nov. 1881.	9,573 12 0	2,121 5 7	9 "	
Total ...	290 0	260,000	...	36,317 5 7	22,635 6 5	...	
Dugarázpatnam 1st Plantation.	50 0	25,000	17th Dec. 1873.	6,641 12 0	6,384 5 10	4½ feet apart.	3. But experience having shown this distance to be still too close, 4th and 5th plantations were planted at 9 feet apart.
Do. Additional Plantation.	...‡	75,000	1st Feb. 1875.	4,000 0 0	3,747 4 10		
Do. 2nd Plantation.	50 0	50,000	4th Dec. 1874.	6,757 2 9	6,754 4 3	4½ "	4. Further experience showed that it is more profitable to plant at 12 feet apart, and the plantations now being formed are planted at this distance. 28,000 trees have been planted this year (1882-83) at 12 × 12.
Do. 3rd do. ...	40 0	60,000	18th Oct. 1875.	6,449 3 8	6,448 15 11	4½ "	
Do. 4th do. ...	50 0	30,000	5th Dec. 1880.	6,726 9 3	1,771 0 6	9 "	
Do. 5th do. ...	100 0	50,000	1st Nov. 1881.	7,448 12 0	1,835 8 3	9 "	
Total ...	290 0	290,000	...	38,023 7 8	26,941 7 7	...	

* Probably about 60 acres. † Probably about 30 acres. ‡ Probably about 50 acres.

Statement of Casuarina Plantations with Extent, Number of Trees, &c., in Nellore District—(Continued).

Name of the Village or Plantations.	Extent.	Number of Trees.	When planted.	Amount of Estimate.	Actual Expenditure up to 31st December 1882.	Distance at which the Trees are planted.	Remarks.
1	2	3	4	5	6	7	8
Gúdúr Taluk—(Contd.)	A. C.			RS. A. P.	RS. A. P.		
Tope at Kistnapatam Salt Cotaur.	5 25	208	...	50 0 0	50 0 0	...	
Do. Dugarázpatnam do. ..	9 18	220	...	142 0 0	142 0 0	...	
Do. do. Travellers' Bungalow.	0 78	20	...	...	...	...	
Total ...	15 21	448	...	192 0 0	192 0 0	...	
Total for Gúdúr Taluk ...	985 21	896,448	...	1,24,625 0 7	84,002 9 3	...	
Nellore Taluk.							
Vutukuru 1st Plantation ...	40 0	52,000	22nd Oct. 1875.	7,556 10 2	7,544 8 6	4½ feet.	
Do. 2nd do. ...	40 0	30,000	12th Nov. 1880.	7,847 0 5	2,197 13 10	9 „	
Do. 3rd do. ...	100 0	50,000	1st „ 1881.	7,448 12 0	1,782 9 0	9 „	
Total ...	180 0	132,000	...	22,852 6 7	11,524 15 4	...	
Varany 1st Plantation ...	50 0	25,000	1st Jan. 1874.	6,641 12 0	6,545 8 3	4½ feet apart.	
Do. Additional Plantation.	...*	75,000	1st „ 1875.	4,000 0 0	3,793 11 6		
Do. 2nd Plantation ...	50 0	60,000	1st Feb. „	8,963 13 6	8,925 13 10	4½ „	
Do. 3rd do. ...	50 0	67,000	22nd Oct. „	8,462 8 11	8,108 3 5	4½ „	
Do. 4th do. ...	50 0	30,000	12th Nov. 1880.	6,743 5 1	1,658 4 7	9 „	
Do. 5th do. ...	100 0	50,000	1st „ 1881.	7,448 12 0	1,564 2 6	9 „	
Total ...	300 0	307,900	...	46,260 3 6	30,595 12 [illegible]	...	
Allipuram 1st Plantation ...	18 74	5,270	...	8,757 7 2	8,450 10 5	9 feet.	All the large trees in this plantation were felled and utilized for famine camps.
Do. Additional Plantation.		5,000	1st Nov. 1878.			6 „	
		1,671	1st „ 1880.			6 „	
Do. 2nd do. ...	20 0	9,000	1st „ 1881.			9 „	
Total ...	38 74	20,941	..	8,757 7 2	8,450 10 5	...	

Iskapalle Plantation ...	19 48	3,161 200 139	... 1st Nov. 1878. 1st Jan. 1880.	895 3 1	834 14 11	6 feet. 6 „ 6 „	
Total ...	19 48	3,500	...	895 3 1	834 14 11	...	
Total for Nellore Taluk ...	538 22	463,441	...	78,765 4 4	51,406 4 9	...	
Atmakúr Taluk.	A. C.			RS. A. P.	RS. A. P.		
Mamuduru	10 64	1,000	Not known	...	...	6 feet apart.	Two thousand trees were planted here in 1868, and all these, with the exception of 50 scattered trees, were cut down for famine purposes. Subsequent to the famine years the present young trees numbering 1,800 have been planted with a yearly expenditure of Rs. 96. The actual expenditure incurred cannot now be ascertained.
		300		...	...	6 feet.	
Pullanellapally	1 16	500		...	...	9 „	
Total ...	11 80	1,800	...	...	...	...	
Total for Principal Division.	*1,535 23*	*1,361,689*	...	*2,03,390 4 11*	*1,35,408 14 0*	...	
Kávali Taluk.							
Tummalapenta No. I ...	19 76	100 100 100 100 100 100 121 278 13,389	1874 ... ... 1878 1880 1874	6,553 0 0	6,531 8 2	3 yds. 2½ „ 2¾ „ 1 „ 1½ „ 2 „ 4 „ 4 „ 1½ „	These plantations were planted experimentally. Intermediate trees cut.
No. II ...	33 98	11,232 10,524	1876 to 1878	13,587 11 8	13,303 11 8	1½ „ 2 „	Do. do.
Total ...	53 74	36,144	...	20,140 11 8	19,835 3 10	...	
Kandukúr Taluk.							
Rámapatnam No. I ...	13 25	7,676	1874	20,182 7 6	20,454 7 6	1½ yds.	Intermediate trees cut (*vide* Sub-Collector's Circular, No. 169, 16th September 1881).
Do. „ II ...	12 74	6,005	1875			1½ „	
Do. „ III ...	13 17	21,391	1876 to 1877			2 „	
Total ...	39 16	35,072	...	20,182 7 6	20,454 7 6	...	

* Probably about 50 acres.

Statement of Casuarina Plantations with Extent, Number of Trees, &c., in Nellore District—(Continued).

Name of the Village or Plantations.	Extent.	Number of Trees.	When planted.	Amount of Estimate.	Actual Expenditure up to 31st December 1882.	Distance at which the Trees are planted.	Remarks.
1	2	3	4	5	6	7	8
Kandukúr Taluk—(*Contd.*)	A. C.			RS. A. P.	RS. A. P.		
Banganapalle	6 0	335	Not known	...	...	...	
Pakala	6 45	440					
Ongole Taluk.							
Kottapatam old tope ...	...	1,164	Not known	...	...	3 yds.	Intermediate trees cut (*vide* Sub-Collector's Circular, No. 169, of 16th September 1881).
No. I ...	10 0	11,228	1875			1½ "	
No. II ...	15 0	12,175	1876	19,195 0 0	14,885 1 2	1½ "	
No. III ...	10 0	5,116	1877			1½ "	
Total ...	35 0	29,683	...	19,195 0 0	14,885 1 2		
Kanuparthi near Salt Cutcherry.	5 53	971	1873			3 yds.	
North of the platform No. 2.	...	54					
East of the platform No. 1.	198 30	8,529					
New plantation	6 85	4,000	1877			1½ "	
West of the platform No. 2.	7 30	3,282	1873	17,138 6 7	16,676 6 7	2 "	
Puluguvadi tope	4 50	4,302	1873			1½ "	
East of the Canal	1,264 44	11,305 5,503 2,180	1875			1½ "	
Total ...	1,486 92	40,126	...	17,138 6 7	16,676 6 7	...	
Total for Sub-division ...	*1,627 27*	*141,800*	...	*76,656 9 9*	*71,851 3 1*	...	
Grand Total ...	3,162 50	1,503,489	...	2,80,046 14 8	2,07,260 1 1	...	

N.B.—It will be seen from the items printed in italics that the outlay incurred on the trees planted in the Sub-division is quite disproportionate to the expenditure on the trees in the principal division. But this is to be explained by the fact that the former were planted and upkept till lately by the Salt and the Sea Customs Department. They were transferred to this department, some in 1877 and others in 1882.

KUNDRUM,
25th February 1883.

(Signed) SOMASUNDRUM,
Wood Overseer.

Resolution—dated 8th November 1883, No. 3362.

Mr. Hutchins was deputed by G.O., No. 1422, dated 16th December 1882, upon special duty to examine the casuarina plantations on the coast, beginning with the Nellore district. His report upon the plantations of Nellore has been received and will now be submitted to Government.

2. Mr. Hutchins does not state how many days he devoted to the examination of these plantations. The Board note with surprise that he stopped short at Tumalapenta and went no further up the canal. The reason he gives for this course is that the plantations to the north of that place are small, young and of uncertain age (paragraph 12), but the Conservator disagrees with him as to their not being worth visiting. The Board consider that the plantations at Ramapatam and Kottapatam, in the Kandukúr taluk, ought certainly to have been examined, especially the old plantation at Kottapatam, which was well grown nine years ago and would have afforded materials for report which were wanting in the more recently planted areas which Mr. Hutchins examined. A few hours' further progress on the canal would have brought Mr. Hutchins within sight of the interesting casuarina plantations at Vádarévu in the Bápatla taluk of the Kistna district; and the Board therefore regret that more was not done to make this report complete.

3. With regard to the calculations contained in the report, the Board concur with Mr. Gamble that the area chosen at Tumalapenta was not well selected for experimental measurements upon which to frame deductions generally applicable, and that it will be necessary to supplement these observations as further details and more valuable data are available.

4. The Board have perused with much interest the Conservator's remarks in the fifth and following paragraphs of his interesting letter giving rough estimates of the yield of timber per acre and the annual supply of firewood which can possibly be despatched by canal to Madras. It is proposed, however, to formally constitute these plantations reserved forests, when their area will be more accurately ascertained and, as suggested in paragraph 8, the work of planting will be carried out on a more carefully prepared plan.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.

Copy to the Conservator of Forests, Northern Circle.
" " Conservator of Forests, Southern Circle.
" " Deputy Conservator of Forests, in charge of Central Office of Accounts.
" " Collector of Nellore.

ORDER—dated 9th February 1884, No. 199, Revenue.

Forest, No. 25.

The Government have perused with interest Mr. Hutchins' report on the casuarina plantations on the Nellore coast, which, it is observed, did not reach the Government office until the 21st December last, though the Board's Proceedings read above is dated 8th November and was received on the 20th idem.

2. The Government share the Board's regret that Mr. Hutchins did not examine the important plantations referred to by them, but agree with the Conservator of Forests, Northern Circle, in thinking that the measurements recorded will be of value.

3. As in the case of Mr. Hutchins' Eucalyptus report, six hundred copies of that now received will be printed for distribution for communication to other Governments and Administrations and for sale.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.
,, Superintendent, Government Press.
,, Director, Government Cinchona Plantations, Parks and Gardens, Nílgiris.
,, Superintendent, Government Central Museum.

No. 199A.

Copy to the Government of India, Home Department.

(Signed) H. E. STOKES,
Secretary to Government.

Exd. J. Henricus.

100 Copies.

Inc. No. 621/84

Govt. of {1884} Madras.

REVENUE.

Issued.

Recd. *Encl.*

G.O., 9th February 1884, Nos. 199, 199A.

A05 80

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre. Madras 8th March 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Reve:
Settlt. Party No. III

FEBRUARY.

Casuarina Plantations

on the Nellore coast.—Reviewing Mr. Hutchins' report on the —.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from the Consulting Engineer to the Government of India for Guaranteed Railways, Lahore, to the Director of Revenue Settlement and Agriculture, Madras, dated Lahore, 15th January 1884, No. 136 G :—

In reply to your No. 3198-758, dated 8th December 1883, to the address of the Secretary to Government, Punjab, I have the honor to inform you that I am not aware of any maps of the nature you describe having been prepared in the Punjab.

2. Should such maps have been prepared with reference to any of the State Railways of the Province, they would, no doubt, be obtainable on reference to the Director-General of Railways.

No. 351.

Submitted to Government, in reference to G.O., No. 2440 C., dated 6th December 1883. The Director-General of Railways will be addressed.

2. No reply has been received from the Government of the North-Western Provinces to this office No. 3198-758, dated 8th December 1883, written under the instructions conveyed in the Government Order quoted above; but the Director has obtained, through the courtesy of the Department of Agriculture and Commerce in that Province, copies of the forms used and instructions issued for the registration of road traffic there. These are being submitted to Government with a separate note.

Madras, 8th February 1884. (Signed) W. WILSON,
Dir. of Rev. Sett. and Agriculture.

To the Joint Secretary to Government, Public Works Department, Railway Branch.

Read—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Joint Secretary to Government, Public Works Department, Railway Branch, dated Madras, 9th February 1884, No. 368 :—

With my letter, No. 3197-757, dated 8th December 1883, I submitted copy of a letter which, in accordance with the instructions conveyed in G. O., No. 2440 C., dated 6th December 1883, I had addressed to the Governments of the North-Western Provinces and the Punjab in regard to the system adopted in those provinces for the registration and mapping of road traffic in connection with projects for railway extension.

2. From the Punjab I have received a reply, which has been separately submitted, to the effect that nothing is known there of the system regarding which information was sought, and suggesting a reference to the Director-General of Railways, a suggestion that I have acted upon.

3. From the North-Western Provinces I have received no official reply; but through the courtesy of Mr. Benett, the Director of Agriculture and Commerce, and his Assistant, Major Pitcher, I have received, demi-officially, copies of the forms used and of the instructions issued there for the registration of road traffic. These

(enclosure No. I. embracing instructions, form of day-book, form of daily total sheet and classified list of articles, and, enclosure No. II., district register of traffic by stations) I submit with this letter.

4. "Registration" in the North-Western Provinces "is conducted with the definite object of obtaining data concerning the commercial utility of metalled roads and, in addition, of ascertaining the lines along which traffic is most extensive and which, therefore, offer the best prospects for railway extension." (Director's Report for 1881-82.)

5. The traffic on any given road is, as a rule, registered during one year only, the establishments being at the end of each year moved to new roads. This system differs from that adopted in Madras, where the absolute traffic between British India and Native States is registered permanently at fixed stations.

The establishments consist of specially-trained men supervised by two superintendents on Rs. 50 a-month each.

6. In selecting stations, care is taken not to put them in the immediate vicinity of large towns or villages, the purely local traffic of which might otherwise be included in the returns.

I understood that a station was never less than 5 or 7 miles distant from a town or village of any size.

7. Traffic is divided into "long" and "short" distance traffic: the former includes everything going over 10 miles, the latter everything going not more than 10 miles. This distinction is, I think, a good and an useful one, and should be adopted here also.

8. Each station is provided with two day-books, one for the traffic going one way, the other for that going in the opposite way on the same route, and it is considered desirable never to have less than two clerks, or a clerk and a peon who can read and write, at each station.

9. The routes are numbered and named.

10. The traffic is registered and classified in accordance with the classified list of articles furnished by the Government of India with their resolution of 14th June 1876, No. 2-358-364 (in G.O., No. 444, Revenue Department, dated 16th April 1883).

11. In Madras the registering clerks generally do not classify the traffic (Board's proceedings, No. 382, dated 4th March 1881) though there is no objection to their doing so, provided arrangements are made for the due check of their classification in the taluk offices (Board's proceedings, No. 1745, dated 15th August 1881).

There seems to be no reason for not adopting generally, in this Presidency, the rule of the North-Western Provinces, that the clerks who register shall also classify the traffic.

12. From the day-books the traffic is posted in abstract into "daily total sheets," two of which are kept for each day-book, one for "long distance" traffic, the other for "short."

The totals are made up at the end of the month and forwarded to the district offices, so as to reach them by the 7th of the month following that to which they relate.

13. From these daily total sheets the traffic is posted into registers which show for each month and quarter the traffic registered at each station.

14. The outcome of traffic registration in the North-Western Provinces is to show the traffic by *stations*: in Madras it is shown by *articles*.

15. It does not appear that in Madras any rules or forms have been generally prescribed for the registration of inland traffic. The day-book used in Kurnool (Board's proceedings, No. 382, dated 4th March 1881), the only one apparently which can be got in the Board's office, differs considerably from that used in the North-Western Provinces; but the daily total sheet or abstract used in Kurnool is practically identical with that of the North-Western Provinces. The Kurnool day-book

provides for information which is superfluous, as, for instance, the entry of the owner's name, while in other respects it is not so complete as that of the North-Western Provinces. The Madras return shows not only the weight and number but the value of the several articles of merchandize as given by the persons in charge of them. In the North-Western Provinces the values are entered only in the final registers and only at the close of the year.

16. In my letter of 8th December 1883, No. 3197-757, I suggested that, as a check against the registration of the same traffic more than once over any given part of its route, the points of original departure and ultimate destination should be recorded at each station.

Reference to the day-book of the North-Western Provinces will show that my suggestion has been anticipated in that Province.

17. I think that, in this Presidency, the plan adopted in the North-Western Provinces of dividing the India classified list into two classes, A and B, the one embracing all articles that are usually reckoned by *weight*, the other, all articles usually reckoned by *number*, might well be followed.

18. From the final statements of our inland traffic with Native States, prepared in the office of the Board of Revenue, the system of registering road traffic appears to be well understood in this Presidency, while the outcome, though in a different form, is practically identical with that of the North-Western Provinces.

19. The day-book used in this Presidency, so far as I can judge of it by that of Kurnool, is not, in my opinion, so good as that of the North-Western Provinces, the rules and forms of which, modified in the manner suggested in the accompanying copies of them, might, I think, be adopted for the registration of traffic in connection with the projected lines of railway referred to in G.O., No. 2440 C., dated 6th December 1883. I think, however, that in the day-book the values of the articles registered might as well be entered, if entered at all,* as they are now in the case of the frontier traffic, by the clerks in charge of the stations.

* Value in these returns is really immaterial; what is wanted is "weight" and "number," that is some gauge of probable railway receipts.

20. In paragraph 6 of the note which accompanied this Government Order it is stated that the replies of certain Collectors who had been asked to name the points where they thought traffic takers should be stationed on certain indicated routes would, when received, be transferred to this department; and letters from the Collectors of North Arcot, Madura, Tinnevelly and Anantapur have accordingly been received in this office from yours from time to time. I shall be glad to have instructions as to what I am to do with them. I do not know whether the Government wish this particular kind of traffic to be finally dealt with by this department. The Board of Revenue deals with the at present registered inland traffic, the registration of which is of the same nature as this; and I shall be glad to know whether Government wish the registration of this particular traffic to be dealt with by this department instead of by the Board.

Read—the following Note by the Joint Secretary to Government, Public Works Department, Railway Branch, dated 18th February 1884:—

Abstract.—Transferring, for favor of early orders, correspondence on the subject of registration of traffic in connection with projects for railway extension.

No. 396 C.

Transferred to the Revenue Department for favor of early orders.

(Signed C. J. SMITH, Lieut.-Colonel R.E.,
Joint Secy. to Govt., P.W.D.
Railway Branch.

Chepauk,
18th February 1884.

To the Revenue Department, with enclosures.

Order—dated 21st February 1884, No. 253, Revenue.

Miscellaneous.

The Government are of opinion that the organization of the traffic registration referred to and the tabulation of the results should be done under the orders of the Board of Revenue. As Mr. Wilson is a member of that body, the special knowledge of the subject which he has acquired will be utilised, and the advantage of the employment of the Board's trained establishment will be gained.

2. It appears to the Government that, in this matter, the value of the statistics will depend more on the selection of the stations than on systems of registration and tabulation, and that local knowledge of the currents of trade is the chief requisite. This consideration points to the employment of Collectors, under the Board of Revenue, to carry out the work.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Public Works Department, Railway Branch.
,, the Board of Revenue, with two enclosures (form of day-book and district register).
,, the Director of Revenue Settlement and Agriculture.

Exd. E. Fernandez.

100 Copies.

Q. No 775/84

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. *Encl.*

No 671

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter

Dept. of Rev. Sett. & Agre. } Madras 17 March 1884 }

(By order)

Seeyaiah

1st. Assistant

To
The Dy. Director of Revn.
Sett. Party No. III

G.O., 21st February 1884, No. 253.

FEBRUARY.

Traffic Statistics.

Considering that the collection and tabulation of — in connection with projects for railway extension should be done under the orders of the Board of Revenue.

959

3RD MARCH 1884, No. 282, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from the Government of India, Department of Finance and Commerce (Accounts and Finance—Salaries, Establishments, &c., Land Revenue), to the Right Honorable the Earl of Kimberley, Her Majesty's Secretary of State for India, dated Simla, the 6th July 1883, No. 174 :—

We have the honor to forward a copy of correspondence with the Government of Madras, from which your Lordship will see that we have sanctioned a revision of the salaries of the Deputy Directors of the Madras Revenue Settlement Department. The correspondence will also show that we have under consideration a further proposal for the appointment of two new Assistant Directors, a class of officers which it is proposed to revive.

2. We beg that the sanction which we have accorded may receive your Lordship's confirmation.

READ—the following letter from the Right Honorable the EARL OF KIMBERLEY, Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India Office, London, 11th October 1883, No. 65, Revenue :—

I have considered in Council your Excellency's letter No. 174 (Finance and Commerce), of the 6th July last, requesting that the sanction accorded by your Government to a revision of the salaries of the Deputy Directors of the Madras Revenue Department may be confirmed.

2. The present staff of Deputy Directors consists of four officers, each drawing Rs. 787½ per mensem, while one of them, being a military officer, receives an extra Rs. 500, their combined salaries amounting to Rs. 3,650 per mensem. The proposal by the Madras Government which you have sanctioned in lieu of this scale is, that the salaries of the superior uncovenanted officers of the department should be assimilated to those drawn by similar officers in the Survey Department, and that the two senior deputies be allowed a consolidated salary of Rs. 1,100 per mensem *plus* Rs. 5 batta per diem, without distinction between military or covenanted and uncovenanted officers, and that each of the two junior deputies should draw a consolidated salary of Rs. 750, with batta at the rate of Rs. 5 per diem. This amended scheme involves a total outlay of Rs. 3,700 per mensem being an increase of Rs. 50 upon the existing scale.

3. The adoption of the principle of consolidated salaries has already been sanctioned for other departments, and I approve of its adoption for the Madras Revenue Settlement Department. It is not, however, proposed that any of the present incumbents should draw less than their existing salaries, and the immediate effect will, therefore, be to give Mr. Cox, the senior Deputy Director, an increase of salary of Rs. 312½ per mensem.

No. 4280.

Copy forwarded to the Revenue and Agricultural Department for information, in continuation of the endorsement from this department, No. 1809, dated 6th July 1883.

(By Order.)

Dept. of Finance and Commerce,
Simla,
9th November 1883.

(Signed) J. E. O'CONOR,
Asst. Secy. to the Govt. of India.

No. 1100-156—6 (Revenue).

Copy, with copy of the despatch of the Government of India, No. 174, dated 6th July 1883, to which it is a reply, forwarded to the Government of Madras for information.

(By Order.)

Revenue and Agri. Dept.,
Calcutta,
14th December 1883.

(Signed) T. W. HOLDERNESS,
Offg. Under-Secy. to the Govt. of India.

Read—again the following telegram from E. F. WEBSTER, Esq., Secretary to Government, Revenue Department, to the Secretary to the Government of India, Department of Finance and Commerce, Calcutta, dated Fort St. George, 29th November 1883 :—

Please see your despatch No. 278, dated 1st October 1883. Assistant Directors urgently required; may this Government appoint them in anticipation of sanction by Secretary of State.

Read—the following telegram from J. E. O'CONOR, Esq., Assistant Secretary to the Government of India, Department of Finance and Commerce, to the Secretary to Government, Revenue Department, Fort St. George, dated Calcutta, 7th December 1883 :—

Your telegram 29th November. Assistant Directors, Revenue Settlement, sanctioned subject to confirmation by Secretary of State.

Read—the following letter from the Right Honorable the EARL OF KIMBERLEY, Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India Office, London, 13th December 1883, No. 91, Revenue :—

I have considered in Council your Excellency's letter No. 278 (Finance and Commerce) of the 1st October 1883, relative to the addition of two Assistant Directors to the staff of the Madras Revenue Settlement Department.

2. These appointments are asked for by the Government of Madras on the ground that the Settlement Department is at present under officered and that unless it is immediately strengthened, its operations may come to a stand-still.

3. The appointments have therefore my sanction.

No. 293.

Copy forwarded to the Revenue and Agricultural Department for information, in continuation of the endorsement from this department, No. 3618, dated the 1st October 1883.

261

Copy forwarded to the Government of Madras for information, in continuation of the telegram from this Department, No. 1785, dated the 7th December 1883.

Copy, with a copy of the telegram to the Government of Madras, No. 1785, dated the 7th December 1883, forwarded to the Accountant-General, Madras, for information.

(By Order, &c.)

Dept. of Finance and Commerce,
Calcutta,
19th January 1884.

(Signed) J. E. O'CONOR,
Asst. Secy. to the Govt. of India.

Order—dated 3rd March 1884, No. 282, Revenue.

Miscellaneous.

Communicated to the Director of Revenue Settlement and the Accountant-General.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Accountant-General.
,, the Board of Revenue.
,, the Financial Department.

Exd. W. H. French.

80 Copies.

In. No. 754/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 3rd March 1884, No. 282.

No 835/41

Communicated to the Officers in charge of Settlement Parties

Dept. of Rev. Sett. & Agre.
Madras 17 March 1884

(By order)
[signature]
1st. Assistant

To
The Dy. Director of Revenue
Settt. Party No. III

MARCH.

Settlement Department.

Copies of despatches from the Secretary of State confirming Government of India sanction accorded to the revision of the salaries of the Deputy Directors and the appointment of two new Assistant Directors, communicated to certain authorities.

8TH MARCH 1884, No. 331, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 31st January 1884, No. 319 :—

Read—the following letter from F. BRANDT, Esq., Collector of Nílgiris, to the Secretary to the Board of Revenue, dated Ootacamund, 17th January 1884, No. 14 :—

I see reference in the review of the year written by His Excellency the Right Honorable the Governor to a concession made in case of assessment payable on land cultivated with cinchona in the Wynaad, and from extract published by the Collector of Malabar, at page 371 of that District Gazette, dated 12th January 1884, I learn for the first time that Government, in their Order, dated 30th October 1883, No. 1349, exempted from assessment for a period of 5 years (from 1883 to 1887 inclusive) land in Wynaad planted with cinchona, whether held from private proprietors or under Government on putta.

2. This, no doubt, is the order to which His Excellency referred ; it has not been communicated to me, but it applies, I assume, to South-East Wynaad as well as to Malabar Wynaad.

3. I have the honor to request that I may be furnished with copies of the said order, and that I may be informed if I am at liberty to notify that it applies in that part of the Wynaad which is within my jurisdiction.

Resolution—dated 31st January 1884, No. 319.

Submitted for the orders of Government.

2. The Government Order referred to was passed upon a representation made by the Collector of Malabar, and the concession was made as an act of grace in view of the circumstances of the planting interests on the uplands of that district. The order, as it stands, does not apply to plantations beyond the limits of Malabar, and the Board therefore did not communicate it to the Collector of Nílgiris. It rests with Government to say whether the concession is to be extended, and, if so, whether it is to be held applicable to cinchona plantations generally, whether in the Wynaad or elsewhere.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department.
„ the Collector of Nílgiris, with copy of G.O., dated 30th October 1883, No. 1349.

ORDER—dated 8th March 1884, No. 331, Revenue.

Land Revenue, No. 42.

The concession will be held applicable to cinchona plantations generally, whether in the Wynaad or on the Nílgiris.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Director, Government Cinchona Plantations, Parks and Gardens, Nílgiris.

Exd. W. H. French.

70 Copies.

Dis No. 74 2/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 8th March 1884, No. 331.

MARCH.

No 842/42

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agrc. Madras 17 March 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Reve
Settt. Party No. III

Land planted with Cinchona in the Wynaad.

Ruling that the concession made in respect of — whether held under private proprietors or under Government on putta be held to apply to cinchona plantations generally, whether in the Wynaad or on the Nilgiris.

264

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 15th January 1884, No. 106 :—

Read—the following letter from F. BRANDT, Esq., Collector of Nílgiris, to the Secretary to the Board of Revenue, dated Ootacamund, 18th December 1883, No. 472 :—

Referring to G.O., dated 19th October 1883, No. 1307, Revenue, I have the honor to say that it appears to me desirable to make a reference before publishing a notification in the District Gazette and acting upon the order.

2. In my letter, dated 18th September 1883, No. 2818, recorded in Proceedings of Government above quoted, I said that it appeared to me that the intention of Government was, or at all events that Government might be pleased to declare, that the concession made by G.O., dated 28th August 1874, No. 1102, should be held to apply not only to tea, but also to coffee and cinchona and such like special products, and that, accordingly, assessment should not be charged on grass land on which such special products might be cultivated *until the sixth year on the Nílgiris and until the fourth year in the Wynaad.*

3. The Order of Government, dated 19th October 1883, is worded generally, and would apparently cover the recommendation made by me, but (1) the Order is communicated by the Board to the Collector of this district only, (2) in the Resolution of the Board, reference is made to "the Nílgiris" only, and not to the Nílgiri district, nor to the Wynaad.

4. I am not then perfectly certain I am at liberty to notify that, under the orders now received, "grass land planted with coffee or cinchona is now put on the same footing as grass land planted with tea, and is, accordingly, exempt from assessment for a term of five years on the Nílgiri plateau, *and for a term of three years in the Wynaad*"; and I request instructions accordingly.

5. I may add that I made a demi-official reference to the Secretary to Government, Revenue Department, on the subject, almost immediately after receiving the Government Order, but as I have been obliged to defer taking action on the order till now, I think it better to make this official reference.

Resolution—dated 15th January 1884, No. 106.

The Board are of opinion that the notification proposed at paragraph 4 may issue, being in accordance with the terms of the Government Order.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Collector of Nílgiris.
Copy to the Secretary to Government, Revenue Department.

Order—dated 1st February 1884, No. 155, Revenue.

Land Revenue, No. 18.

The Board have correctly interpreted the intentions of Government.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

60 Copies.

In. No. 449/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

No 872

Communicated to the Officers in charge of Settlement Parties and to the Agricultural Reporter

Dept. of Rev. Sett. & Agre.
Madras 19 March 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Reve.
Sett. Party No. III

G.O., 1st February 1884, No. 155.

FEBRUARY.

Waste Land Rules.

Observing that the Board have correctly interpreted the orders of Government making the concession of 1874, in respect of grass land taken up under the — for tea cultivation, applicable in the case of coffee and cinchona.

8TH MARCH 1884, No. 237, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 21st February 1884, No. 595:—

Read—the following letter from J. SHORTT, Esq., M.D., retired Deputy Surgeon-General, to the Director of Revenue Settlement and Agriculture, Madras, dated Yercaud, 4th February 1884:—

I have to acknowledge with thanks a paper on the extirpation of "Bodu." In doing so, I beg to offer the following remarks. Having been for many years interested in the cultivation and cure of tobacco, I have read with much interest the papers you have kindly sent me relating to "Bodu" or *Philipœa Indica*. The *Philipœa Indica* belongs to the *Orobanchaceæ* or Broom Rape family, a natural order of dicotyledonous plants growing parasitically upon the roots of other species.

2. "They are peculiar looking plants, being destitute of true leaves, but are furnished instead with scales; the type of the family being the Broom Rape or *Orobanche*, of which there are many species which are believed to be injurious to crops." They send root-like processes into the substance of the plant, whence they derive nourishment. The Orobanches are attached to the roots of other plants and are truly parasitic, but from possessing tubers and roots are believed by some scientists to derive nourishment in the ordinary way also. As a rule, parasites generally attack the weak plants in every family of plants, although grown from the same seed, and at the same time there come up many weak ones: this weakness appears inherent to the seed, whilst one seed will produce a stout healthy plant, another will produce a weak one. The same thing occurs among animals of the same breed as well as from the same parents, which we cannot account for. The *Philipœa Indica* in like manner only attacks the weak plants, its flowers and fruits. The fruit is a capsule containing minute seeds. The capsules ripen, burst and scatter their seeds on to the soil in which they may sprout the following season if favorable, or they may continue dormant in the soil for one or more seasons.

3. Now the potato fungus is recognised to be the *Phytophthora infestans*, and is the cause of what is known as the potato-disease at home. The most recent plan recommended is the thorough burning of the refuse of the diseased potato fields to exterminate this pest in supersession to all other remedies, and this is what I advise should be done to the tobacco fields, in doing which the seeds in the soil will be completely destroyed; and, if followed up subsequently in searching for and removing any plants that may have escaped the fire before it has time to flower and mature seed, in this way the pest will be completely exterminated in one season.

4. It does not follow that because the plant is an annual it cannot survive one season. The seeds of annuals are known to survive several seasons by remaining dormant in the soil till circumstances favor their germination. The only objection that may be started against the burning of the tobacco fields would be the destruction of much vegetable matter from the soil; but should the burning be carried out soon after the crop is taken off, benefit, rather than harm, would accrue to the soil, and it will be prepared to receive the subsequent freshes and a fresh deposit of silt, and this method will be found to add materially to the subsequent successful growth of the tobacco plant. Weeds and grass, besides other refuse from the tobacco fields, will not be wanting to burn the fields thoroughly.

No. 292 A.

Communicated to all Collectors in continuation of this office No. 1894 A., dated 27th December 1883.

(Signed) W. WILSON,
Dir. of Rev. Sett. and Agriculture.

DEPT. OF REV. SETT. AND AGRI.,
MADRAS,
5th February 1884.

To all Collectors.

(Copy.)

Submitted to the Board of Revenue for information.

(Signed) E. GIBSON,
Secretary, Board of Revenue,
for Director of Revenue Settlement
and Agriculture.

To the Secretary to the Board of Revenue.

Resolution—dated 21st February 1884, No. 595.

Submitted for the information of Government. The thanks of the Board are due to Dr. Shortt for this very interesting letter.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
,, the Director of Revenue Settlement and Agriculture.
,, J. Shortt, Esq., M.D., Yercaud.

ORDER—dated 8th March 1884, No. 337, Revenue.

Miscellaneous.	Recorded.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, Dr. Shortt, Yercaud.
,, Editors' table.

Exd. A. Aubert.

80 Copies.

In. No. 817/84

Govt. of (1884) Madras.

REVENUE.

No 701

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre.
Madras 20 March 1884

(By order)

Sheppard
1st. Assistant

The Dy. Director of Rev. Sett.
Party No. III

Issued

Recd. Encl.

G.O., 8th March 1884, No. 337.

MARCH.

Bodu or Philipæa Indica

Board's Proceedings submitting a letter from Dr. Shortt regarding — recorded.

267

Registered No 22 268

19TH FEBRUARY 1884, No. 242, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to the Secretary to Government, Revenue Department, dated Madras, 6th February 1884, No. 310:—

I have the honor, in reference to paragraph 5 of G O., No. 28, dated 11th ultimo, to inform you that I agree in the views expressed in paragraph 57 of Mr. Benson's report that the best way of inducing our ryots to adopt the improved ploughs that we are introducing to their notice is by practical demonstration of their superiority over the native plough.

2. Advantage will be taken of the approaching Chittoor and all other agricultural exhibitions to do this. From the farm there is being sent to Chittoor a selection of improved ploughs accompanied by skilled ploughmen, and Messrs. Massey and Co. and Messrs. Oakes and Co. are also sending specimens of the implements which they either make or are agents for.

3. It will be one of the special duties of the Agricultural Reporter to arrange for and superintend such exhibitions in the course of his tours which it is intended shall be frequent.

4. In reference to Mr. Benson's suggestion in paragraph 62, that in order to ensure the improvement of stock, all bulls should be compulsorily castrated before they are two years old, I have to remark that this could only be done by legislation and would involve a costly and inquisitorial system of inspection. A measure of the kind would in my opinion be in the highest degree impolitic even were it possible. We must be content, I think, to hope for a better system of stock management and cattle-breeding as the result of the extended education and enlightened self-interest of the agricultural classes.

ORDER—dated 19th February 1884, No. 242, Revenue.

Miscellaneous.

Recorded.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.

Exd. W. H. French.

70 Copies.

No 590/84

Govt. of (1884) Madras.

REVENUE.

No 544

...mmunicated to the ...icultural Reporter ...vernment, Inspector ...ttle Diseases and ... officers in charge ...ttlement Parties in ...mation of this office ...96 dated 12th February

(By order)
[signature]
1st Assistant

...t of Reve: Settt. & Agriculture
...ras 4th March 1884

...Dy. Director of
...e: Settt. Party No. III
...

Issued

Recd. Encl.

G.O., 19th February 1884, No. 242.

FEBRUARY.

Ploughing Exhibitions and Cattle-breeding.

Director of Agriculture's report on Mr. Benson's proposals regarding —, recorded.

To be substituted for G O of

No. 1349 of 30th October 1883

Commd with this office No. 2932

dated 14th November 1883.

Recd Dec 23.

Passed the [illegible]

Reg Dec 27 / 83

Dept. of Rev. Settt & Agri
Madras
3d March 1884 }

268 A

Revenue Depart[ment]

Proceedings of the Madras Govern[ment]

Registered No 25

Read endorsement from Director of Revenue Settlement & Agriculture, Madras, No. 499A/20, dated 16th Feb: 1884 submitting to Government with remarks letter from the Superintendent of Madras Survey submitting Collector's endorsement on application from Mr. J. Twigg, Ag. Head Asst. Collector of Trichinopoly and stating that he may be attached to Madura Survey Party for instruction in Survey.

269

Order thereon, 1st March 1884 No 980

The proposed arrangements for Mr Twigg['s] training in Survey and settlement are approved. He has been appointed to act as Special Assistan[t] Malabar, and he can proceed to his special training from that appointment.

(True Extract)

(Signed) H.E. Stokes

Secy. to Government

(Copy) No 705/30

Communicated to the Dy. Director No Party for information.

G. [illegible]

Dept. of Rev Sett. + agri
6th March 1884

Director of Rev Settlemen[t] and Agriculture

To the Dy. Director of Rev Settlement No III Party

From

The Director of Revenue
Settlement & Agriculture

To

The Dy Director of Revenue
Settlement No III Party

Dated 6 }
Despd } March 1884.
Recd }

No 705/30

Communicating G. O.
No 980 dated 1 March 1884
regarding the approval of
the proposed arrangements
for Mr Twigg's training in
Survey & Settlement.

270

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from H. M. Kisch, Esq., C.S., Officiating Under Secretary to the Government of India, Revenue and Agricultural Department (Revenue), to the Secretary to the Government of Madras, dated Calcutta, 21st January 1884, Circular No. 8 R:—

Letter from the Government of the North-Western Provinces and Oudh, No. 2311, dated 30th October 1883, and enclosure.
Letter from the Government of the North-Western Provinces and Oudh, No. 2652, dated 17th December 1883, and enclosure.

I am directed to forward, for the information of His Excellency the Governor in Council, a copy of the papers marginally noted as an interesting record of an experiment in respect to irrigation by means of steam power.

Enclosures.

Letter from J. Reid, Esq., Officiating Secretary to the Government of the North-Western Provinces and Oudh, to the Secretary to the Government of India, dated Camp Lucknow, 30th October 1883, No. 2311:—

With reference to your letter, No. 120 R, dated the 4th April 1882, I am directed to forward, for the information of His Excellency the Governor-General in Council, copy of a memorandum drawn up by Mr. Wilson, Executive Engineer attached to the Agricultural Department, of the cost of irrigating by steam power on Captain Chapman's estate at Behti.

Memorandum of the Cost of Irrigating by steam power on Captain Chapman's Estate at Behti.

This estate is situated in the Partabgar district and comprises five villages. Captain Chapman divides the land roughly into three parts—

	Bigahs.
(i) Lake	7,000
(ii) Upper land	10,000
(iii) Kachar	6,000

The lake was probably at one time part of the bed of the Ganges river, which now flows about two miles from the centre of the depression. Before the reclamation works were started, nearly the whole of the 7,000 bigahs, which Captain Chapman calls the lake, was liable to be flooded by the river; but in the greater part the flooding was temporary, the water remaining in only 3,000 bigahs, which formed Behti Tal.

2. Out of the 4,000 bigahs outside the Tal, 1,500 bigahs near the sites of the five villages had always been highly cultivated and was irrigated from wells. The remaining 2,500 bigahs were not irrigated, and it was at first proposed to irrigate this land by means of the pumping machinery; but this proposal has since been abandoned.

3. Captain Chapman states that at Christmas time there was usually from 1 to 3 feet of water over the 3,000 bigahs which constitute Behti Tal.

In order to reclaim this land a strong embankment was made to keep out the flood water of the river, and pumping machinery was erected to remove the drainage water that collected in the hollow.

In order to reduce the quantity of water to be pumped out embankments have been made across the mouth of 13 ravines, down which the drainage of the upper land used to come. The ravines have thus been converted into tanks, and it is only when these overflow that any of their water reaches the lake. It was necessary to divert one rather large stream, called by Captain Chapman the Káli Nadi, by digging a channel through the highland into the Ganges above Shahpur.

During the rains it is necessary to pump out all the drainage water that collects in the hollow and to keep it from rising high enough to injure the crops. In dry weather the land is irrigated by pumping water from the river into a channel that runs round the Tal.

4. Captain Chapman proposes to put these 3,000 bigahs of reclaimed land under kharif and rabi crops every year.

In the kharif he will have—

1,000 bigahs under indigo,
1,000 „ „ rice, and
1,000 „ „ til.

In the rabi season there will be—

1,000 bigahs under rape, linseed, &c.,
1,000 ,, ,, oats, and
1,000 ,, ,, wheat, barley, &c.

Up to the present this system has not been thoroughly carried out. The rains of last year were heavier than those of the two preceding years, and sufficient fuel was not collected to enable the engines to be worked at their full power during the rains. Consequently the land was not thoroughly drained in time for the rabi sowings. The lowest land was not sown at all and part of the land that was sown had been insufficiently ploughed.

5. For drainage and irrigation purposes there are four 12 horse-power portable engines, and the same number of 15-inch centrifugal pumps. The latter are fixed on wheels, so that they can be moved about.

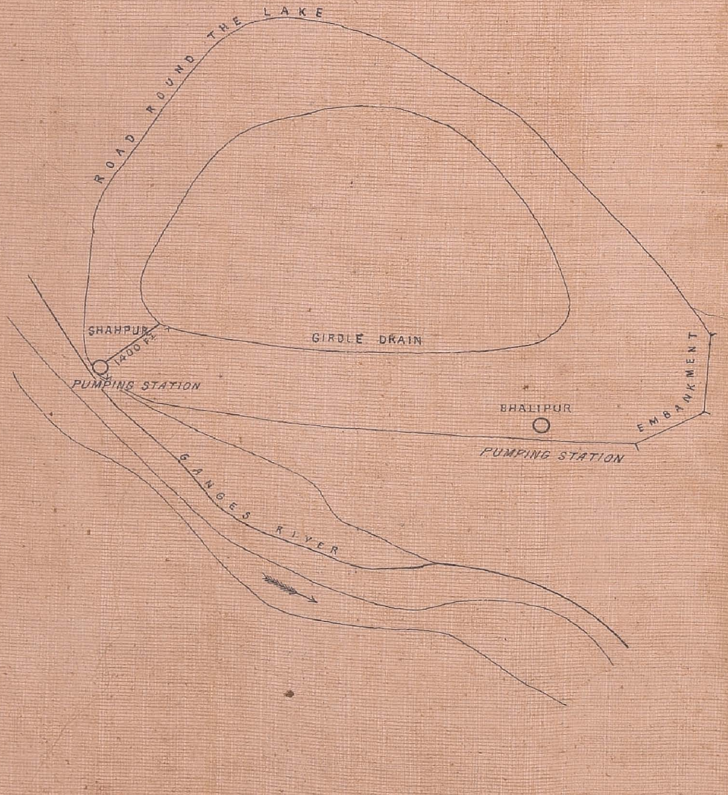
The irrigation station is at Shahpur, close to a high bluff, at the foot of which the river runs.

The drainage pumping station is situated at Bhalipur, about three miles to the east of Shahpur; it is in highland to the west of the embankment which keeps the flood water of the river out of the lake.

Each of the stations has been built to take two engines and pumps. Major Western, R.E., who was deputed by Government to inspect the estate, has furnished Captain Chapman with a plan and estimate for enlarging the Shahpur station, so that four engines and pumps may, when required, be used for irrigation purposes. Captain Chapman proposes to carry this out, and also to enlarge the Bhalipur station, so that three engines and pumps may be worked there.

Two engines and pumps will ordinarily be kept at each station, but when the platforms have been altered four engines and pumps can be worked at Shahpur and three at Bhalipur. Both engines and pumps being portable, they can be moved from one station to the other.

6. The arrangements for irrigation are explained by the following sketch, which includes the whole of the 7,000 bigahs:—



The water raised from the river at the Shahpur pumping station flows down a channel to the girdle drain. This drain is dug all round the Tal on a contour line 5 feet above the lowest part of the lake. Its depth is 5 feet; therefore the bed of the drain is level with the lowest part of the Tal. The girdle drain is about 9 miles long, and the channel from the pumping station to this drain is 1,400 feet in length. The girdle drain is filled by the pumps, and the cultivators irrigate their fields from it by means of baskets.

Captain Chapman states that in the cold weather the water must be raised $12\frac{1}{2}$ feet by the pumps.

7. The engines are by Messrs. Hornsby and Sons of Grantham in Lincolnshire. They are each 12 nominal horse-power.

It may be mentioned that the nominal horse-power of an engine simply shows the size of its cylinders. The power given off by an engine depends on the pressure of steam employed and the number of strokes made by the piston per minute. In portable engines by different makers the power that can be developed varies from $1\frac{1}{2}$ to 3 times the nominal power.

Messrs. Hornsby and Sons' engines are designed to work with steam at a pressure of 60 lb. per square inch, and guaranteed to give off double their nominal horse-power if tested with a dynamometer.

A peculiarity of these engines is that the cylinders are placed inside a steam chest which forms part of the boiler, so that condensation of steam in the cylinders is prevented.

8. The pumps are "the Invincible" centrifugal pumps, manufactured by Messrs. J. and H. Gwynne of London. The quantity of water which they will raise depends on the height of lift and the power employed; but the manufacturers state that they are designed to discharge from 3,000 to 5,000 gallons per minute.

Only part of the power given off by the engine to the pump is usefully employed in lifting water, the rest being wasted in friction and eddies in the pump. The ratio between the useful work done in lifting water and the total work expended in driving the pump is called the "efficiency" of the pump.

The efficiency of a centrifugal pump depends on the velocity of the fan and the height of lift. Experiments with ordinary centrifugal pumps similar to Gwynne's have shown that for lifts up to 20 feet, when they are discharging the quantity of water for which they are designed, their efficiency is about 0·6. When the discharge is greater or less than this, the efficiency is reduced.

9. As mentioned before, Messrs. Hornsby and Sons guarantee that their 12 horse-power engine can develop a power equal to 24 horse-power. If this power is given off by the engine and the efficiency of the pump is 0·6, the rate of the useful work done will be represented by 14·4 horse-power.

This is equal to raising 475,200 lb., or about 212 tons, to a height of 1 foot per minute. Hence one engine and pump is capable of raising 3,802 gallons per minute to a height of $12\frac{1}{2}$ feet, which is the height of lift at Behti in the cold season.

This may be considered the greatest amount of work that can be done by one engine and pump.

10. Owing to the favorable cold-weather rains no irrigation was done at Behti during the past rabi season, and in February, when I visited the place with Major Pitcher, the pumps were not at work. We were therefore unable to test the working of the engines, but Captain Chapman has kindly furnished the following information as to the area irrigated and the consumption of fuel:—

The engines and pumps are worked for ten hours a day.

When the girdle drain has been filled, one engine and pump will keep it full and will irrigate 25 bigahs (= 15·625 acres) in a day.

Grass has been used for fuel, but it did not prove satisfactory, and faggots of jhau (*Tamarix indica*) are now used. The amount of fuel consumed depends on the state of the faggots. If they are too dry and are consumed rapidly, they give comparatively little heat. Captain Chapman estimates the cost of cutting and carrying the jhau at Rs. 125 per engine per month.

Coal has been used, and Captain Chapman found that 18 maunds were used in a day. It costs 12 annas a maund.

Before estimating the cost of irrigation it will be useful to calculate the power that must be given off by the engine in order that 25 bigahs of land can be irrigated.

11. To cover an acre of ground to a depth of one inch, about 100 (accurately 101·27) tons of water are required. The usual depth of a watering is from 2 to $2\frac{1}{2}$ inches, but to include loss by percolation and evaporation in the girdle drain and water-courses, a depth of 4 inches should be allowed. Hence the quantity of water required to irrigate one acre of land is 400 tons.

The water is raised $12\frac{1}{2}$ feet. Therefore the amount of useful work done in irrigating one acre of land is $400 \times 12\frac{1}{2} = 5{,}000$ foot-tons.

Twenty-five bigahs or 15·625 acres are irrigated by one engine and pump in a day. Therefore the useful work done by one engine and pump in one day $= 15{\cdot}625 \times 5{,}000 = 78{,}125$ foot-tons, which is at the rate of 8·84 horse-power.

If the efficiency of the pump is 0·6, the power given off by the engine is $\frac{78,125}{0·6} = 130,208$ foot-tons in a day of ten hours. This is equal to 14·73 horse-power.

12. It has been mentioned above that each engine is guaranteed to be capable of giving off a power equal to 24 horse-power. According to the above calculation it is not necessary that an engine should develop a greater power than 15 horse-power in order to irrigate 25 bigahs a day, and this is well within the maximum power that can be obtained from the engine.

It is, however, advisable to have ample power, the danger of breaking down being thereby lessened.

13. *Consumption of fuel.*—Captain Chapman states that one engine irrigating 25 bigahs in a day consumes 18 maunds of coal. It has been calculated that the engine will irrigate this area if it gives off a power equal to 14·73 horse-power during the ten hours it is worked. Hence the consumption of fuel per horse-power per hour is $\frac{18 \times 80}{14·73 \times 10} = 9·8$ lb. Trials of engines of a similar type to those made by Messrs. Hornsby and Sons have shown that the consumption of fuel is about 6 lb. of good English coal per effective horse-power per hour, not including that used in getting up steam in the boiler. It depends, however, very greatly on the stoking.

Good Indian coal is estimated to be equal to two-thirds of the same weight of good English coal, and Mr. A. Campbell, the Superintendent of the Canal Workshops at Roorkee, estimates that he uses 10 lb. of coal per effective horse-power per hour, including the coal used in getting up steam and all contingencies. This is very nearly the same rate that has been calculated above from Captain Chapman's figures.*

14. It must be pointed out that the calculations in the three preceding paragraphs involve two assumptions—(i) the efficiency of the pump has been assumed to be 0·6,† and (ii) the quantity of water used has been estimated by allowing a depth of 4 inches on the area irrigated.

† Paragraph 8.

15. As regards the quantity of water used to irrigate an acre of land. Experiments on a canal distributary about 14 miles in length have shown that when there was good demand, the total quantity of water used, including that lost by percolation and evaporation in the distributary and in the village water-courses, was equal to a depth of about 5 inches on the area irrigated.

Captain Chapman's girdle drain is 9 miles long and the water is raised from it by baskets. The wastage in the water-courses and the actual quantity of water applied to the fields will be less than in canal irrigation, where most of the water is given flush.

At the same time, as pointed out by Major Western, the alignment of the girdle drain is not favorable to economy of water. The bed of the drain is on a level throughout, and as the surface of a flowing stream must have a slope, it follows that when the water is flowing the depth of water at the upstream end must be greater than at the downstream end some 4 miles away. If the bed of the drain had a slope of about 1 foot per mile, less water would be required to fill the drain, and there would be less loss by percolation.

A depth of 4 inches on the area irrigated will probably prove a sufficient allowance to cover all losses.

16. In order to obtain accurate statistics it would be necessary to have the area irrigated and the quantity of fuel used recorded daily during a rabi season or, better still, during a whole year. It will probably be found, for instance, that the average area irrigated per maund of coal is greater when the demand for water is sufficient to keep three or four engines at work than when the demand is slack, and not more than one engine is worked.

Captain Chapman is not using coal at Behti, and the heating power of the jhau faggots depends greatly on their condition at the time they are used. A record of the area irrigated and weight of fuel used daily at Behti would therefore be of comparatively little use.

17. The greatest area which it is required to irrigate in any season is 3,000 bigahs. If one engine can water 25 bigahs a day, four engines can irrigate the total area once in thirty days.

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* Major S. S. Jacob has kindly furnished the following information as to the consumption of fuel by the pumping engines at the Jeypore Waterworks:—

Total quantity of water raised during the past four years, 591,305,439 gallons.

Total quantity of fuel used has been 72,603 maunds of coal.

Some wood has been used, but this has been reduced to an equivalent amount of coal by taking three maunds of wood = one maund of coal.

Quantity of water raised by one maund of coal = 8,944 gallons.

Total height from surface of water in the river to centre of pipe emptying into service reservoir is 109 feet; length of pipe between the river and the reservoir is 1,950 feet, and its diameter is 9 inches.

The velocity of flow through the pipe is about 4 feet per second and the head lost in overcoming the friction of the pipe and the resistance of the bends is about 16 feet. Hence the water is raised against a total head of $109 + 16 = 125$ feet.

The useful work done by one maund of coal is $8,144 \times 10 \times 125 = 10,180,000$ foot-lb., and this is equivalent to 5·14 horse-power for one hour.

Hence the amount of coal consumed per horse-power of useful work per hour = 15·8 lb.

If the efficiency of the pump is 0·6, the quantity of coal consumed per effective horse-power given off by the engine per hour is $15·8 \times 0·6 = 9·48$ lb.

There are two pairs of 11 horse-power horizontal engines with 12-inch cylinders and 24-inch stroke. One pair is condensing, the other non-condensing. Steam is obtained from Root's boilers at 80 lb. pressure per square inch.

For rabi crops a watering once a month is ample; in fact, once in forty days is generally sufficient.

For indigo Captain Chapman says that one watering every fifteen days should be given. This crop is sown from 1st April to the 15th of May, during which time there is no other crop on the ground. Three engines will be more than sufficient to water the 1,000 bigahs under indigo once every fifteen days. As the plant gets stronger less frequent watering is required, and one watering in twenty days should be sufficient: this can be done by two engines.

From the latter part of May to the first fall of rain rice is sown. The rice is sown in the fields and not in nurseries, the object of sowing it so early being to get it up before heavy rain sets in, so that it may not be damaged by being swamped.

This crop requires a great deal of water, and it appears doubtful if the four engines and pumps working ten hours a day can raise enough water to allow the 1,000 bigahs of rice to be sown before the rains as well as to irrigate the 1,000 bigahs under indigo, but the work required can be done by increasing the number of working hours in a day.

So far as irrigation is concerned the pumping power is ample. In a year of average rainfall and without cold-weather rains it will probably be necessary to work three engines ten hours a day for three months during the rabi season, and the same number of engines on the average for three months for the kharif crops. In years of scanty rainfall it may be necessary to work all four engines and pumps both night and day during part of the kharif season, but it is not probable that such a contingency will occur more than once in four or five years, and it is hardly worth while to increase the pumping power in order to meet it more easily.

18. *Cost of the engines and pumps.*—The machinery purchased by Captain Chapman consists of five 12 horse-power engines, four 15-inch pumps, one thrashing machine, one bhusa machine, one winnowing machine, and one reaping machine. The total cost landed at Behti was Rs. 60,000. The home prices of the above machines are as follows:—

	£
Five 12 horse-power engines fitted with patent straw-burning apparatus, at £341 each	1,705
Four 15-inch centrifugal pumps with pipes for 14-feet lift, at £180 each	720
Thrashing machine, bhusa machine, winnowing machine, reaping machine, say	275
Total ...	2,700

Captain Chapman was unable to furnish details of the shipping and railway charges of each machine, but they may be assumed to vary with the home prices. In that case the cost of the four engines landed at Behti was Rs. 30,300, and that of the four pumps Rs. 16,000.

19. The annual charges for the engines and pumps are—

(i) The interest on the original cost, say at 5 per cent.
(ii) The cost of repairs.
(iii) An allowance for depreciation.

The yearly charges on account of repairs vary considerably, being very small during the first two or three years, but increasing rapidly with the age of the machinery. It is customary to allow a percentage on the first cost to represent the average yearly cost of repairs, and a similar allowance is made to cover the depreciation. The usual annual charge to cover both repairs and depreciation is 10 per cent. on the first cost of portable engines and 6 per cent. on that of centrifugal pumps. Hence the annual charges for the engines and pumps at Behti will be as follows:—

	RS.
Interest on Rs. 46,300 at 5 per cent	2,315
Depreciation and repairs of engines, 10 per cent. on Rs. 30,300	3,030
Depreciation and repairs of pumps, 6 per cent. on Rs. 16,000	960
Total ...	6,305

This is at the rate of Rs. 2·10 per bigah, or Rs. 3·36 per acre of the area irrigated.

20. *Masonry works and irrigation channels.*—The irrigation station at Shahpur has cost about Rs. 3,000, and Major Western's estimate for enlarging it is Rs. 2,800. Hence the total cost will be Rs. 5,800.

In Captain Chapman's report the quantities of earthwork in the drainage and irrigation channels appear to be given together. An allowance of Rs. 700 per mile, or Rs. 7,000 altogether, should cover the whole cost of the irrigation channels. Hence the total cost of masonry works and channels is about Rs. 12,800.

The annual cost of maintenance and repairs of works on the Ganges canal amounts to about 1·1 per cent. on the capital cost. On these small works it will probably come to 2 per cent.

Therefore the yearly charges on account of the masonry works and irrigation channels at Behti should be—

	RS.
Interest on Rs. 12,800, at 5 per cent.	640
Repairs and maintenance, at 2 per cent.	256
Total ...	896

This is at the rate of Rs. 0·30 per bigah, or Rs. 0·48 per acre.

21. *Establishment.*—The permanent subordinate establishment consists of three maistries and a cooly, drawing altogether Rs. 34 per month, or Rs. 408 per annum. An engineer, Mr. Armstrong, is in charge of all the machinery on the estate, and it is only fair that part of his pay, say Rs. 100 a-month, should be charged to irrigation. At this rate the total cost of the permanent establishment chargeable to irrigation is Rs. 1,608 per annum.

The cost of the temporary establishment employed when the engines are worked varies with the character of the seasons. It may be estimated on the average at half the cost of the permanent subordinate establishment, or Rs. 204 per annum. Hence the total charges on account of establishment amount to Rs. 1,812, which is at the rate of Rs. 0·60 per bigah, or Rs. 0·97 per acre.

22. *Cost of fuel.*—Captain Chapman has found that 18 maunds of coal are used by one engine and pump irrigating 25 bigahs. The quantity of fuel used, however, cannot be considered by any means constant. It depends greatly on the stoking, and will probably be found to vary with the demand for water and the number of engines working at a time.

The price of coal landed at Behti is about 12 annas a maund. Hence the cost of coal required to irrigate 25 bigahs is Rs. 13·50. To this should be added 10 per cent. for contingencies, bringing the cost up to Rs. 14·85. This is at the rate of Rs. 0·59 per bigah, or Rs. 0·95 per acre.

Using jhau faggots as fuel, Captain Chapman finds that the cost of cutting and carrying the wood is Rs. 125 per month for each engine. The area irrigated during the month is 750 bigahs. Hence the cost of cutting and carrying fuel is Rs. 0·17 per bigah or Rs. 0·27 per acre. Adding 10 per cent. for contingencies, the cost comes to Rs. 0·30 per acre.

The faggots should have some marketable value, but I am unable to ascertain this.

23. The yearly cost of irrigation may be divided into two parts : (i) fixed and (ii) variable. The former includes the interest charges on original outlay, the charges for maintenance and repairs of the works and machinery, and allowance for the depreciation of the latter, and the cost of the permanent establishment. These charges are independent of variations in the seasons.

The variable charges depend on the number of times the land is irrigated. They include the cost of the fuel and of the temporary establishment engaged when the engines are worked. The cost of the latter is very small, and may be included under the head of permanent establishment.

24. Table A shows the fixed annual charges :—

TABLE A.

Description.	Original Cost.	Interest Charges		Repairs, Maintenance and Depreciation.		Total Charges.	Total Charges per Acre.
		Rate per cent.	Amount.	Rate per cent.	Amount.		
	RS.		RS.		RS.	RS.	RS.
Four portable engines	30,300	5	1,515	10	3,030	4,545	2·42
Four centrifugal pumps	16,000	5	800	6	960	1,760	0·94
Masonry works and irrigation channels ..	12,800	5	640	2	256	896	0·48
Establishment	..	..	..	..	..	1,812	0·97
Total ..	59,100	..	2,955	..	4,246	9,013	4·81
	Contingencies at 5 per cent. on ..				9,013	451	0·24
	Total fixed yearly charges ..					9,464	5·05

25. Table B shows the variable cost, which depends on the number of waterings. The cost of coal required to irrigate an area of land is taken at Rs. 0·95, and of jhau at Rs. 0·30 (paragraph 21) :—

TABLE B.

Kind of Fuel used.	Number of Waterings.	Cost of Fuel per Acre.
		RS.
Coal	2	1·90
Do.	5	4·75
Do.	9	8·55
Jhau	2	0·60
Do.	5	1·50
Do.	9	2·70

26. Table C shows the total cost per annum of irrigating an acre of land under different circumstances : —

TABLE C.

Kind of Fuel used.	Number of Waterings.	Cost per Acre.		
		Fixed.	Variable.	Total.
Coal	2	5·05	1·90	6·95
Do.	5	5·05	4·75	9·80
Do.	9	5·05	8·55	13·60
Jhau	2	5·05	0·60	5·65
Do.	5	5·05	1·50	6·55
Do.	9	5·05	2·70	7·75

In a year of very favorable rainfall the rabi will require no irrigation, and the 2,000 bigahs under indigo and rice will require about three waterings : hence the average number of waterings given to the whole land will be two.

In a year of ordinary rainfall the rabi fields may require two or three waterings, and the indigo and rice three waterings. The average number of waterings per acre will be about five.

In a year of draught the average number of waterings per acre may reach eight or nine.

27. It will be useful to compare the results obtained above with the cost of canal irrigation. The following figures are taken from the Irrigation Revenue Report of these provinces for the year ending 31st March 1882 :—

Upper and Lower Ganges Canals.

	RS.
Total capital outlay to the end of year	5,23,00,987
Maintenance and repairs, including tools and plant	5,78,946
Establishment (General and Revenue), including leave and pension allowances	7,59,537
Area irrigated during the year in acres	13,55,862

28. Table D shows in detail the cost of irrigating an acre of land by the upper and lower Ganges canals and steam power at Behti :—

TABLE D.

Description of Charges.	By the Upper and Lower Ganges Canals.	By Steam Power at Behti, using Coal as Fuel.
Interest on capital at 4 per cent.	1·54	0·76
Maintenance and repairs of works	0·43	0·08
Depreciation and repairs of machinery	...	1·28
Establishment	0·56	0·58
Contingencies	...	0·15
	...	2·85
Coal sufficient to irrigate 3,000 bigahs five times or 5,000 bigahs three times	...	2·85
Total ...	2·53	5·70

In this table interest has been charged at 4 per cent. in both cases, this being the rate charged on the capital cost of the Government irrigation works. The area irrigated at Behti has been taken at 5,000 bigahs (= 3,125 acres), this being the area which will be irrigated in a year of average rainfall, viz., 3,000 bigahs in the rabi and 2,000 bigahs in the kharif.

It will be seen that the capital outlay per acre is much greater in the case of canals than in that of the Behti works, the interest charges in the two cases being Rs. 1·54 and Rs. 0·76 respectively.

The establishment charges which have been allowed at Behti are almost the same as those which obtain on the canals, Rs. 0·58 against Rs. 0·56.

For maintenance and repairs of works the charges on the canals amount to only Rs. 0·43 per acre, while at Behti the charges for maintenance and repairs of works and for repairs and depreciation of machinery with sundries, such as waste, oil, &c., amount to Rs. 1·51.

The total charges on the canals amount to Rs. 2·53 per acre. At Behti the fixed charges alone are estimated at Rs. 2·85 per acre, and the total charges in a year of average rainfall, using coal as fuel, at Rs. 5·70 per acre.

29. The statements in paragraphs 24 to 26 show the cost of irrigating by steam power, when the height of lift is 12½ feet, and centrifugal pumps worked by portable engines of the simplest type are used to raise the water, the whole expenses on account of the pumping machinery being charged. But at Behti three of the engines and pumps are used for draining the lake and would be required if no irrigation were done. Therefore the charges against irrigation on account of the engines and pumps should be very much reduced, and in a average year the actual cost of irrigating an acre of land, using jhau faggots as fuel, probably does not exceed Rs. 4 for the two fasls.

It remains to consider to what extent the cost of irrigation might be reduced by using better engines.

30. During the last few years portable engines have been greatly improved. Three types of portable engine may be noted. In the first, which is the simplest, the slide valve is arranged to cut off steam at a fixed point of the stroke—generally about one-half. The amount of power required is regulated by altering the pressure of steam in the boiler in proportion to the load. The steam pressure does not exceed 60 or 70 lb. per square inch.

In engines of the second type there is a separate slide valve for expansion and the steam can be cut off at any point from about one-sixth to one-half of the stroke. The working pressure of steam is from 80 to 100 lb. per square inch. The power is proportioned to the load on the engine by adjusting the expansion valve and altering the quantity of steam used, the pressure of steam in the boiler remaining constant. In some engines the expansion valve is acted upon automatically by the governor. As usually worked, the steam is cut off at from one-fourth to one-fifth of the stroke and, compared with engines of the first type, there is a saving in the consumption of fuel of about 25 per cent. The expansion gear, however, is complicated and liable to get out of order, and in places where skilled labor is scarce this disadvantage more than counterbalances the gain derived from the reduced consumption of fuel.

The third type of portable engine has compound cylinders. The steam from the boiler is admitted to a small cylinder in which it is cut off at half a stroke. But, instead of escaping at once into the atmosphere after having done its work in the small cylinder, it is admitted to a large cylinder, in which it is expanded until its pressure is very little above that of the atmosphere. The steam is used at from 100 to 120 lb. per square inch, and is expanded about six times. This amount of expansion is obtained by a simple slide valve on the small cylinder, and the elaborate expansion gear of the second type of engine is avoided. Other disadvantages result from adopting a high rate of expansion in one cylinder, owing to the great variation in the temperature of the steam and in its pressure on the piston. In the compound-cylinder engine these variations are spread over two cylinders; the steam is used more economically, and the strains on the mechanism are more uniform. The consumption of fuel in compound engines as they are now made is from 25 to 30 per cent. less than in engines of the first type.

Compound-cylinder engines therefore combine the economy of the second type of engine with the simplicity of the first, and there can be no doubt that they are admirably suited for agricultural purposes. The first portable engine with compound cylinders was exhibited in 1880 by Messrs. Garrett and Sons at the Carlisle meeting of the Royal Agricultural Society, and similar engines are now made by several manufacturers. The system has also been applied to traction and ploughing engines.

If portable engines with compound cylinders were substituted for the engines at Behti, the first cost would be increased very little—the same amount of work being done with less steam and consequently with smaller boilers—and the cost of fuel used would be reduced by at least 25 per cent.

31. The selection of pumping machinery at Behti was narrowed by the necessity of making it available for both drainage and irrigation purposes. Had the engines been required for irrigation only, Captain Chapman would probably have had them stationary.

The advantage of a portable engine is its compactness. It can be set to work without skilled labor, requires no foundations, and is consequently cheaper than an ordinary stationary engine with separate boiler. The latter, however, being always under cover and on fixed foundations, is more durable than the former. The usual yearly allowance to cover depreciation and repairs of a stationary engine is 6 per cent., and of a boiler 10 per cent. of the original cost. An allowance of 10 per cent., in the case of portable engine, is certainly not too high.

It will be seen, therefore, that though the cost of a stationary engine and separate boiler with their foundations may be greater than that of a portable engine, the annual charges on account of the former may be less than those on account of the latter.

32. A condenser can be added to a stationary engine in order to condense the steam in the cylinders, thus increasing the work done by the steam while the same amount of fuel is used—a great advantage in places where fuel is dear and water for condensing purposes is easily procured.

It is important to keep portable engines as light as possible, and they are never fitted with condensers.

33. Centrifugal pumps are in very general use, being cheap and easily erected. Where the height of lift does not exceed 25 feet and large quantities of water are to be raised, they are the most suitable pumps for the purpose.

Those designed by Professor James Thomson of Belfast are the most efficient. They owe their superiority to their having a whirlpool chamber, in which the velocity which the water has when it leaves the revolving fan is gradually reduced before the water reaches the delivery pipe. This improvement is said to increase the efficiency of the pump by about 10 per cent.

34. The following is a rough estimate of the cost of irrigating the land at Behti by means of compound stationary engines and centrifugal pumps:—

A whirlpool centrifugal pump made by Messrs. Williamson Brothers, Canal Iron Works, Kendal, is designed to discharge from 6,100 to 7,600 gallons per minute. In paragraph 9 it has been shown that one of the engines and pumps at Behti is capable of raising 3,802 gallons per minute to a height of 12½ feet, and this is half the maximum discharge of the abovementioned whirlpool pump. Hence two of these pumps will be required. The price of one pump in England with foot-valve and pipes for a lift up to 14 feet is £280, and the pump can be delivered at Behti for about Rs. 5,600.

The manufacturers state that, in order to work this pump efficiently when the height of lift is 12½ feet, the engine should give off a power of from 33 to 41 horse-power. The lower power will prove ample for the irrigation to be done.

The patent "Yorkshire" engines, manufactured by Messrs. J. Fowler and Co., of Leeds, have compound cylinders and are designed for a working pressure of 120 lb. per square inch, the steam being expanded six times. They are warranted to be capable of developing a power equal to three times their nominal horse-power. A 15 (nominal) horse-power engine will work one of the pumps. Its price with condenser is £240. It should be fitted with wheel-gearing, which is better than belts for driving large pumps. The cost of the engine complete, delivered at Behti, will be about Rs. 6,000.

A boiler suitable for working the above engine costs £180 in England, and will cost about Rs. 3,600 landed at Behti.

The cost of the engine-house, boiler-house, with chimney, coal-shed, supply wells, &c., may be estimated at Rs. 20,000. If the irrigation channels were properly aligned, the expenditure on them would be rather greater than it has been on those at Behti, as the latter are entirely in digging. Their cost, with irrigation outlets, should not exceed Rs. 10,000.

Hence the estimate of the first cost of the works is as follows:—

	RS.	RS.
Two 15-horse power "Yorkshire" engines at Rs. 6,000	12,000	
Two 16-horse power boilers at Rs. 3,600	7,200	
Two whirlpool centrifugal pumps with 24-inch pipes at Rs. 5,600	11,200	30,400
Engine-house, boiler-house, with chimney, coal-shed, supply wells, &c.	20,000	
Irrigation channels	10,000	30,000
Total ...		60,400

35. The fixed annual charges on account of the above are given in table E. They amount to Rs. 4·22 per acre for the two fasls :—

TABLE E.

Description.	Original cost.	Interest Charges. Rate per cent.	Interest Charges. Amount.	Repairs, Maintenance, and Depreciation. Rate per cent.	Repairs, Maintenance, and Depreciation. Amount.	Total charges.	Total charges per acre.
	RS.		RS.		RS.	RS.	RS.
Two stationary engines	12,000	5	600	6	720	1,320	0·70
Two boilers	7,200	5	360	10	720	1,080	0·57
Two centrifugal pumps	11,200	5	560	6	672	1,232	0·66
Engine-house, boiler-house, irrigation channels, &c.	30,000	5	1,500	2	600	2,100	1·12
Establishment	..	..	..	..	..	1,812	0·97
	60,400	5	3,020	..	2,712	7,544	4·02
	Contingencies at 5 per cent. on				7,544	377	0·20
	Total fixed yearly charges ..				..	7,921	4·22

36. The variable charges, using coal at 12 annas per maund as fuel, may be estimated at Rs. 0·60 for each watering of an acre. This allows between 7 and 8 lb. of Indian coal (about 5 lb. of good English coal per effective horse-power given off by the engine* per hour) which should be ample to cover all contingencies.

* 11-7 lb. per horse-power of useful work measured by the water lifted.

With care in stoking the cost of fuel might be reduced to Rs. 0·50 for each watering of an acre.

37. Table F shows the total annual charges per acre under different conditions as to the number of watering, using coal as fuel :—

TABLE F.

Number of Waterings.	Cost per Acre. Fixed.	Cost per Acre. Variable.	Cost per Acre. Total.
2	4·22	1·20	5·44
5	4·22	3·00	7·22
9	4·22	5·40	9·62

Comparing this with table C, which gives the annual cost of irrigating an acre of land with portable engines of the simplest kind, it will be seen that by using stationary engines with compound cylinders, the fixed charges may be reduced by about 20 per cent., and the total charges by from 24 to 30 per cent., according to the number of waterings required.

38. The engines at Behti are worked only 10 hours a day and do not appear to be worked by any means up to their full power. Before comparing the cost of irrigating by canals and by steam power with stationary engines, it is necessary to ascertain what area can be irrigated by the latter.

The whirlpool centrifugal pumps with 24-inch pipes are designed to discharge from 6,100 to 7,600 gallons per minute. The mean of these is 6,850 gallons = 30 tons very nearly. To raise this amount of water the engine must give off 37-horse power, which is well within the limit of power which can be developed by the engine.

The two engines and pumps can therefore raise 60 tons of water per minute, or 3,600 tons per hour. Allowing 400 tons for a watering of one acre, including loss in distributaries and water-courses, 9 acres can be irrigated in an hour.

The two engines may be allowed to work 12 hours daily. In case of one of them breaking down, the irrigation can be maintained by the other engine working night and day, while the former is being repaired.

In a day of 12 hours the two engines can irrigate 108 acres.

The number of days between successive waterings of wheat varies greatly in different parts of the provinces; but in the drier districts where irrigation is most required, the interval is from 30 to 40, and may be said to average 35 days.

In the kharif the interval between successive waterings of indigo and maize is from 15 to 20 days, of sugar-cane and cotton from 25 to 35 days.

Allowing a mean interval of 35 days in the rabi and of 20 days in the kharif, the area that can be irrigated by the two engines and pumps is 3,780 acres of rabi and 2,160 acres of kharif crops, or 5,940 acres during the year.

39. In table G the cost of irrigating an acre of land in a year of average rainfall with the machinery estimated for in paragraph 34 is compared with the cost of irrigation by canals :—

TABLE G.

Description of Charges.	By the Upper and Lower Ganges Canals.	By Steam Power with Stationary Engines.
Interest on capital at 4 per cent.	1·54	0·41
Maintenance and repairs of works	0·43	0·10*
Depreciation and repairs of machinery	...	0·34
Establishment	0·56	0·56
Contingencies	...	0·06
		1·47
Coal sufficient for three waterings	...	1·80
Total ...	2·53	3·27

The figures in the third column (except the charges for establishment) are obtained by dividing the annual charges given in table E among the 5,940 acres which can be irrigated. The establishment charges are taken equal to those on the canal. The latter include the cost of establishment for distributing the water, measuring the area irrigated and collecting the revenue in addition to leave and pension allowances. Considering the large quantity of water with which each canal officer has to deal, it is certain that if similar charges were included in the cost of irrigation by steam power, the total establishment charges per acre would not be less than those on the canal.

The Lower Ganges canal was opened about four years ago, and the irrigation from it is by no means fully developed. In another five or six years the annual charges on the two canals together will probably be reduced to Rs. 2 per acre in a year of average demand for water.

40. The engine specified in paragraph 34 has been selected as a good engine of simple construction without any complicated gearing, and fairly economical in working. The consumption of coal has been allowed for at the rate of 7½lb. of Indian coal per effective horse-power per hour, and it has been stated that this may be reduced by good stoking.

Seven and-a-half lb. of Indian coal are equivalent to 5 lb. of good English coal. The best steam engines now made consume less than 2 lb. of coal per effective horse-power per hour.

In determining the comparative economy of different engines, however, freedom from break-downs, first cost, and the cost of repairs must be considered as much as consumption of fuel. I have no data of the cost of engines which have proved most economical in the consumption of fuel. But if large engines of from 150 to 200 effective horse-power with suitable pumps were substituted for those specified in paragraph 34, the first cost per horse-power would be reduced ; and if at the same time the engines and boilers were designed for a working pressure of 150 or 160 lb. per square inch, less fuel would be used per horse-power. In a large pumping scheme then it may be possible to bring the cost of irrigation on a 12⅓-feet lift down to Rs. 2·50 in an average year, but with coal at 12 annas a maund there does not appear to be much prospect of reducing it below this.

41. In this memorandum I have attempted to use the experience gained by a visit to Captain Chapman's estate, and the information kindly furnished by him, in order to estimate the cost of irrigation by steam power, using engines of various kinds, when the water is lifted 12⅓ feet ; and to compare the same with the cost of irrigation by the two largest canals in these provinces. Though the estimates are but rough approximations, I hope that they will help to show how the case for irrigation by steam power stands in these provinces.

It has been said that it should be cheaper to lift water from a depth of 20 or 30 feet than to bring it two or three hundred miles from the foot of the Himalayas.* It appears, however, from the above calculations that even when the height of lift is 12⅓ feet, it is only in a large pumping scheme with powerful engines that the cost of irrigating an acre in an average year can be reduced to Rs. 2·50, the cost of irrigation by the Upper and Lower Ganges canals in 1881-82.

* Answers to questions put by the Famine Commission, by E. C. Buck, Esq., C.S.

* The cost of a properly aligned distributary to irrigate the land at Behti has been estimated at Rs. 10,000. The cost of a distributary which will carry 16 cubic feet per second and irrigate 6,000 acres in a year will be not less than Rs. 20,000. To allow for this the interest charges should be increased by Rs. 0·07, the charges for maintenance and repairs of works by Rs. 0·03, and the total charges by Rs. 0·10 per acre.

If the height of lift were 20 feet, the cost of irrigating an acre could not be reduced much below Rs. 4, as the cost of raising the water would be increased by 60 per cent., though the charges for distribution would be the same.

There are numerous places in these provinces where canal water cannot be obtained and irrigation by steam power could be introduced. For instance, the existing canals take off nearly all the water of the Ganges and Jumna that can be made available for canal irrigation, but there is still enough water passing down the rivers below the canal heads to supply a large number of pumps. Owing to the general level of the land near the rivers being so much above the water surface in the cold season, some difficulty will be found in finding suitable sites; but there are doubtless lands now unirrigated where water would be worth Rs. 6 or Rs. 8 per acre per annum, and where it could be supplied by pumping for less than this.

42. In connection with this subject the recently invented "Buckett" caloric engine may be noticed In place of a boiler there is a closed furnace, in which coke or charcoal, which is the fuel used, is introduced at regular intervals. The fire is first lighted, air is then forced by an air-pump into the furnace, part of it entering the space below the fire and passing through the fuel, and the remainder entering the chamber above the fire. The air mixed with the gases produced by combustion becomes intensely heated and, having no room to expand, becomes compressed. The air mixed with the hot gases is admitted into the cylinder in the same way as steam is admitted into the cylinder of a steam-engine. The pressure moves the piston and at the end of the stroke the air is discharged from an exhaust pipe.

The quantity of air passing through the fuel is regulated by means of a governor, so that the fuel is consumed in proportion to the power developed by the engine. The pressure in the furnace reaches 37 lb. per square inch.

In a trial with a 12-horse power engine the quantity of fuel consumed was about $2\frac{1}{4}$ lb. of gas coke per effective horse-power per hour, and it is said that a small engine developing $1\frac{1}{2}$ horse-power uses only 6 lb. of coke per hour.

There is no possibility of an explosion, and the engines appear very compact, the furnace being fixed on the frame which carries the engine. They are used in light-houses to work the Siren fog-signals—a fact which should go far to prove their safety and freedom from break-downs. They appear very suitable for use in this country.

One of these engines is more expensive than a stationary compound engine with separate boiler of the same effective power, but no boiler-house is required. Where coke or charcoal is cheaply obtained, the annual charges on account of one of these engines may prove to be less than on account of a steam engine.

The 19th July 1883.

(Signed) W. J. WILSON,
Assistant Engineer, on Special Duty.

ENCLOSURE No. 2.

Letter from R. SMEATON, Esq., Officiating Secretary to Government, North-Western Provinces and Oudh, to the Secretary to the Government of India, dated Allahabad, 17th December 1883, No. 2652.

With reference to your letter No. 1058R., dated the 4th December, I am directed to submit, for the information of His Excellency the Governor-General in Council, a copy of a note by Mr. E. C. Buck on Captain Chapman's estate of Shahpur.

Memorandum by E. C. BUCK, Esq., Director, Department of Agriculture and Commerce, North-Western Provinces.

I have visited Captain Chapman's estate known as the Beti Tal estate on the Ganges at the request of Colonel Fraser, C.B., with the view of obtaining such general information of its agricultural condition as to satisfy Government of its capabilities. By Colonel Fraser's wish I have been accompanied by Mr. Hodges, District Engineer of Allahabad, whose opinion is to be given on the character of certain engineering works still under course of construction.

2. The submission of a report by Captain Chapman himself to the address of the Commissioner, Rai Bareli (at so recent a date as the 15th of March), which contains a very clear account of the character and objects of the operations which Captain Chapman has undertaken, renders it unnecessary for me to enter into any detailed description of the estate. I give a reference to the number and date of Captain Chapman's report, which should be read before the perusal of the present memorandum.

See No. 617 of 1878, dated 15th March, from Commissioner, Rai Bareli, to Personal Assistant to His Honor the Lieutenant-Governor.

3. I have been allowed by Captain Chapman to read a private communication made by him to his Calcutta agents (dated 20th March), in which a statement of the agricultural prospects of his estates (including Shahpur) is drawn up, and which was prepared of course

without any reference to the present inquiry. Another source of information is the paper containing an advertisement for a debenture loan, of which a copy is enclosed, and the estimate contained in which was verified by an agent deputed by Messrs. Gillanders Arbuthnot of Calcutta.

4. I may preface the remarks in the following paragraphs by stating that this is not my first visit to the Beti Tal estate, which I was permitted by Captain Chapman to inspect about two years ago. My object was at that time to learn the character of the operations which Captain Chapman was undertaking with a view to the possibility of their being imitated in other parts of the country. I at once recognised the extreme value of the experiments which were being tried, and have referred to them in official communications to Government. I have been looking forward to the issue of them with considerable interest, and believe that the results will not improbably give rise to a system of improving land on the banks of our large rivers which will be of immense benefit to the agricultural interests of the Provinces. The system (to which I will allude again presently) involves the complete command, storage, and utilization of water which runs to waste in the large rivers.

5. I am able to subscribe my personal testimony to the extreme energy, perseverance, and pluck with which Captain Chapman has grappled with the projects conceived by him for the improvement of the estate. I have known him now for some years to have been working with indomitable perseverance, often under circumstances of great difficulty, and in the face of numberless obstacles towards the desired ends, which he has now practically within reach.

6. Captain Chapman's report to the Commissioner of Rai Bareli as to the character of his projects is fully confirmed by my own observations, and I have only to add some details regarding the agricultural value of the land on the estate, and the expenditure which has been or is to be incurred.

The reclaimed portion is in round numbers 4,000 bighas, of which 2,000 are first-class land, of rich alluvial soil, and protected by irrigation. The returns from one bigha of the first-class land are now reported by Captain Chapman to be—

	RS.
Rice	27
Wheat	53
Melons	10
	90

	RS.
In the private estimate to which I have alluded in paragraph 3, Captain Chapman reduced the estimate to Rs. 50, exclusive of bhusa and mustard, which pay for cultivation. This is *sir* land and gives at the above (reduced) rate	1,00,000
Indigo operations comprise this year the delivery of about 300,000 of maunds of plant,* or 1,000 maunds of manufactured indigo at Rs. 50 a maund, profit ...	50,000
(It must be understood that the indigo is brought in not only from Captain Chapman's land, but from villages in the neighbourhood, and is not an asset of the estate.)	
There are 2,000 bighas of kachar land to be sown with indigo for seed (Captain Chapman's own *sir* land), which at 5 maunds a bigha at Rs. 5 profit, give	50,000
Cash collections (rental of land)	20,000
	2,20,000

7. I have not had time to examine the village patwari records in detail, as the patwaris were out in their villages. The papers of the year of settlement show, however, the cultivated area to be nearly 5,000 bighas less than that of the present year (excluding katree or island

* *Note.*	*Country.*	*Government.*
2,500 bighas khunti or last year's growth at	25 maunds.	40 maunds.
2,000 ,, nowdah (early sowings) at	15 ,,	25 ,,
3,000 ,, jamawah at	40 ,,	60 ,,

land thrown up). Of the 5,000 cultivated, from 3,000 to 4,000 are reclaimed jheel land. The reclaimed area is over 4,000 bighas, but some is *reh* and unculturable, and the strong, good-hearted land formed of alluvial deposit is perhaps only 2,000 acres, but as much as that is really good fertile land. It is possible that it may be swamped if Captain Chapman's drainage schemes fail, but I see no *primâ facie* reasons why they should, and this year the whole area is under the best crop of corn I have ever seen in such an enormous stretch of land. Captain Chapman tells me that he has been offered, but will not take, Rs. 10 a bigha for it, and judging by the crops I cannot doubt his assertion. I estimate roughly the rental value of the reclaimed area, including the margin of about Rs. 1,000 to Rs. 1,500 inferior land, at a minimum of Rs. 25,000. Captain Chapman, as I have said in the last paragraph, hopes to get at least Rs. 1,00,000 profit by sale of produce.

8. The general results are therefore—

	RS.
(1) that Captain Chapman estimates his income from landed property, including indigo from neighbouring villages, at	2,20,000 a year.
(2) that his *sir* cultivation of reclaimed land will bring him in	1,00,000 ,,
(3) that the rental value, if the risk of *sir* cultivation is avoided, is not less than	25,000 ,,

9 This income is liable to risk, but not to greater risk than that of any other zemindar, if I am right in assuming that the jheel is safely drained as I believe it to be. The genuineness of Captain Chapman's prophecies about indigo is proved as far as it can be by the area now under the crop, the number of factories built, and the preparations on foot to continue the system of last year, *i.e.*, to sow largely the third or jamawah crop. I cannot verify precisely the accuracy of his estimate of Rs. 50 per maund profit, but I may note—

(1) that his outturn per acre, 25 to 60 maunds, is reasonable and below the ordinary outturn of the Doab (50 to 100 maunds);

(2) that his estimate of one maund color per 300 maunds plant is fair, and if anything low;

(3) that his price, 7 annas country maund (4¾ annas Government maund) or Rs. 29 per 100 maunds, is although a very liberal one, yet liberal on a true principle of giving every pice to the cultivator, and none to a collecting staff, the latter being eliminated by the system of advances (which means a system of arrears) being swept away. As the indigo is brought by the cultivator, so the money is paid to him. The actual outgoings are therefore the larger to the cultivator, yet (stated by Captain Chapman to be) no larger to the purchaser, and the consequence appears to be a readiness to grow the plant, which goes far to secure the permanence of the indigo income.

10. In one way the agricultural income is less liable—or at any rate will be—when Captain Chapman's projects are concluded, less liable to risk than that of ordinary land, because Captain Chapman's scheme includes the protection of every acre by water.

Already a steam-engine has been utilized to ensure the indigo sowings on the estate by pumping up all the available drainage water, and it is impossible to doubt the *bonâ fide* intention of Captain Chapman to construct five deep-bored wells to be worked by steam, as well as a canal from the Ganges, to protect the whole of the *lower area*, as well as to construct a system of storage tanks and canals which are to protect the whole of the *upper area*. Both projects are new of their kind, and will, whether successful or unsuccessful, provide an experiment of extreme value to Government in testing the feasibility of the improvement of the water-supply in two new directions. Arrangements have been made to bring out deep-boring machinery and a trained mechanic from England, while a great part of the reservoir system has been actually completed.

11. A question has been raised whether the Ganges itself is likely to interfere with the reclaimed land. I believe there to be no chance at all of the contingency; the land has been untouched for generations and is protected by a strong head-land. Captain Chapman mentioned to me that he wished to bring in a canal from the Ganges, in the construction of which he required professional advice, so as not to endanger any inroad through his lock-gates, but the canal has not and will not be commenced except under professional advice.

12. A loan of three lakhs would therefore be backed up by a certain income of Rs. 25,000 from the reclaimed land alone, which may be raised, if *sir* cultivation succeeds, to a possible income of Rs. 1,00,000, exclusive of cash collections of Rs. 20,000. On these grounds I think the loan justifiable. I omit here Captain Chapman's income from indigo (and the Ganges island-land (which being on the river is precarious).

13. What Captain Chapman has done and means to do with the money is roughly set forth in the following statement by Captain Chapman :—

	RS.		RS.
Earthwork and buildings ...	60,000	Brought forward ...	2,00,000
Establishment for four years and law expenses	40,000	Bazar ... ... } Bazar boats ... ... } Agricultural machinery—five "Artesian" wells. } Mechanic from England } Working capital ... ... }	1,00,000
Cash paid for rights bought up.	50,000		
Shahpur taluqa wells	50,000		
	2,00,000	Old debts	1,00,000
			4,00,000

Of which Captain Chapman asks for Rs. 3,00,000.

14. It is impossible to say how much money has been or can be spent on the objects specified in the above schedule, and I do not advise Government to enter into any detailed examination of them. Accepting the fact that the security offered is a perfectly safe one, Government will be doing itself a great benefit in assisting Captain Chapman to carry out his experimental projects, which are of a character more practically useful than any which can be carried out on a model farm. Captain Chapman's position is this : five years ago Captain Chapman conceived the following projects to be possible on the Behti Tal estate :—

(1) The reclamation of 4,000 bighas of land from flood.

(2) The irrigation of the whole estate, old or new, *viz* :—

(*a*) above the cliff by the stored water of the upper drainage ;
(*b*) below the cliff and near it by deep-bored wells and steam-power ;
(*c*) by a canal from the Ganges.

(3) The introduction of a system of indigo cultivation new to this section of the country.

(4) The construction of a bazar and roads for the concentration of the produce of the adjacent country in a cheaper line of communication.

(5) The employment on a large scale of English machines.

15. Of course all these projects are to benefit Captain Chapman ; but every one of them is a project which indirectly benefits the whole country, chiefly in the fact that should any one of them be successful, it can be imitated elsewhere. I have for two years been waiting for the result of the storage of ravine water, a system which, if it answers, can be applied to thousands of acres throughout the country. The same may be said of attempting to raise an inexhaustible supply of well water by steam. The employment of agricultural machinery is what the Secretary of State is now asking us to try. The improvement of produce communications lies on the same platform as light railway schemes. For these reasons Government may justly support Captain Chapman as the promoter of a series of agricultural experiments which may be of the utmost service to the country. Government obtains Captain Chapman's services for nothing, and has the best guarantee it can have (Captain Chapman's own interests) of his perseverance in the completion of the experiments, while his *bona fides* is fully established by the immense labor which he has personally undergone to bring matters to their present position, and the great progress which he has made towards the completion of his projects.

16. It can readily be understood that one of Captain Chapman's main objects is to concentrate a grain market in the new outlet on the river at Shahpur (*i.e.*, Shahpur on the north-west, now called by Captain Chapman Conjeerganj). It can be easily understood that Captain Chapman has employed, and wants to employ, his working capital in the agricultural management of the estate. He has exhausted his funds and wants at the same time to buy largely this season for the purpose of establishing his market. I do not think there is any reason to go further, or to inquire in detail how the money is spent. We are perfectly sure of the honest intention of Captain Chapman to push through every one of the schemes which he has in hand, and every one of which is useful to Government, and there seems to be no reason to doubt the value of the security he offers.

17. I may add that if the irrigation and reclamation schemes succeed, Captan Chapman shows a probable increase in income on this and on the Shahpur estates of about Rs. 50,000, which at half rates is revenue Rs. 25,000. I cannot pretend to verify the figures, but there is no doubt that taking the increment down to one-half is to reduce it to a very safe minimum, and on this narrower ground also Government appear to be justified in granting a loan, the increase being almost entirely due to Captain Chapman's personal exertions.

18. Taking, as I do, the higher administrative ground and believing that Government is justified in making a loan to Captain Chapman for the purpose of assisting him in carrying

out large agricultural experiments, which may prove of great advantage to the country, and which he has proved himself to be earnest in undertaking, I have not considered it necessary to ask Mr. Hodges to draw up any detailed estimate of earth-work completed, which would have required a very much longer time. I have taken upon myself the responsibility of confining his report to a general statement of the character of the earth-work completed, and an expression of his opinion on the possibility of an inroad from the Ganges.

ORDER—dated 9th February 1884, No. 209, Revenue.

Miscellaneous.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

80 Copies.

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In No 642/84

Govt. of {1884} Madras.

REVENUE

No 551

Issued

Recd. Encl.

G.O., 9th February 1884, No. 209.

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre. Madras, 8 March 1884

(By order)

[signature]
Asst. Assistant

To
The Dy. Director of Reve: Settl
Party No III

FEBRUARY.

Irrigation by Steam-power.

Papers from the Government of India regarding —, communicated to certain authorities.

278

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to Messrs. Arbuthnot and Co., dated Calcutta, 27th December 1883, No. 1894 A:—

I have the honor, in reference to your letter of 18th current, to inform you that I have just learned from Dr. Watt, Professor of Botany in the University of Calcutta, that the *Phelipœa Indica* or "Bodu" is common in Bengal, and that the ryots' method of getting rid of it there is to persistently cut off the heads of the plants as they appear above ground and before they flower. Dr. Watt further informs me that as the plant is an annual and a parasite, its seed cannot probably survive beyond a single season. The removal of the plant in the way indicated, with a change of crop in the year following, might therefore go far to get rid of the pest.

2. I may mention that Dr. Watt is inclined to question the identity of the plant described by the Godávari Sub-Collector as attacking the *Zingiberaceæ* with the "Bodu" of tobacco.

Communicated to all Collectors, in continuation of this office letter, No. 1322 A, dated 3rd October 1883.

CALCUTTA,
27th December 1883.

(Signed) W. WILSON,
Director of Revenue Settlement
and Agriculture.

(Copy.)

Submitted to Government for information.

(Signed) W. WILSON,
Director of Revenue Settlement
and Agriculture.

ORDER—dated 29th January 1884, No. 141, Revenue.

Miscellaneous.

Recorded.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
" Board of Revenue.

Exd. J. Henricus.

80 Copies.

Dis. No. 391/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

No. 410

G.O., 29th January 1884, No. 141.

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 14 February 1884

(By order)

[signature]

1st. Assistant

To

The Dy. Director of Revenue Settt.
Party No. III

JANUARY.

Bodu, a vegetable parasite.

Copy of a letter from the Director of Agriculture to Messrs. Arbuthnot and Co. regarding —, recorded.

29th January 1884, No. 144, Revenue.

280

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following despatch from the Right Honorable the EARL OF KIMBERLEY, Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India Office, London, 29th November 1883, Revenue No. 84:—

I enclose for your Excellency's information a copy of a letter from Sir Joseph Hooker, and shall be obliged by your giving instructions for a lb. 10 sample of Al being forwarded to this office for transmission to Dr. Thorpe.

Dated 26th October 1883.

(Morinda Citrifolia).

* * * * *

Enclosures.

Letter from W. T. THISELTON DYER, Esq., Assistant Director, Royal Gardens, Kew, to the Under-Secretary of State, India Office, dated 26th October 1883.

I have the honor to transmit the enclosed copy of a letter from Dr. Thorpe, F.R.S., Professor of Chemistry in the Yorkshire College, Leeds, asking for assistance in procuring material for investigating the coloring matter of "Al" (Morinda Citrifolia).

2. The investigation appears to be of considerable scientific interest and might possibly lead to results of economic importance. Sir Joseph Hooker would therefore be glad if the proper authority in India could be instructed to transmit to Dr. Thorpe, say, 10 lb. of the root which he requires.

3. I may be allowed to add that papers Nos. 417—419 in the Madras Revenue Department, June 1879, contain much valuable information about Madras dye stuffs. A copy, if procurable, would be no doubt valuable to Dr. Thorpe.

* * * * * * * *

Letter from T. E. THORPE, Esq., F.R.S., Professor of Chemistry, Yorkshire College, Leeds, to the Assistant Director, Royal Gardens, Kew, dated 24th October 1883.

I am desirous of setting one of my students to work on "Morindia," a substance obtained from the root of *Morindia* Citrifolia; it is I am told the "Al" root of the Hindus and is used as a dye stuff in the Madras Presidency. There is a special interest about the substance on account of its relations to Ali.

2. I should be much obliged to you if you could inform me whether the tree is common, and whether there would be much difficulty in procuring a supply of the root. Perhaps, too, you could inform me how to go to work to obtain it.

No. 36—12-1 (Agriculture.)

The above extract from the despatch of the Secretary of State, and enclosures, are forwarded to the Government of Madras, with a request that the Secretary of State's requisition may be complied with, intimation being given to this department when the samples have been despatched.

(By Order.)

Rev. and Agri. Department,
Calcutta,
15th January 1884.

(Signed) H. M. KISCH,
Offg. Under-Secy. to the Govt. of India.

ORDER—dated 29th January 1884, No. 144, Revenue.

Miscellaneous.

Communicated to the Superintendent, Government Central Museum, with request to forward a sample of the root asked for to this office.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Superintendent, Government Central Museum.
,, the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.
,, the Director, Government Cinchona Plantations, Parks and Gardens, Nílgiris.

Exd. W. H. French.

70 Copies.

981

Ie No 392/84

Govt. of (1884) Madras.

REVENUE.

No 404

Issued

Recd. *Encl.*

G.O., 29th January 1884, No. 144.

[Co]mmunicated to the Officers in charge of Settlement Parties, to [the] Agricultural Reporter and to the Inspector of Cattle Diseases.

[De]pt. of Rev. Sett. & Agre.
[Ma]dras 13 February 1884

(By order)

[signature]
1st. Assistant

[Th]e Dy. Director of Reve: Settt.
Party No. III

JANUARY.

Al Root.

Communicating to the Superintendent, Government Central Museum, papers regarding — required by the India Office, and requesting him to send a sample of the root to this office.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 7th January 1884, No. 15:—

Read—again Proceedings of the Board of Revenue, dated 14th January 1882, No. 92:—

Read—also the following Official Memorandum from the Acting Under-Secretary to Government, Revenue Department, to the Secretary to the Board of Revenue, dated 14th December 1883, No. 436:—

Abstract.—Enquiring if reports from Collectors concerned regarding localities deemed suitable for holding the agricultural exhibitions have reached the Board, and when the Board's report on the subject may be expected.

Read—also the following papers:—

From the Collector	of Anantapur,	dated 12th April	1882,	No.	634.
,, ,,	of Arcot, North,	,, 6th March	,,	,,	87.
,, ,,	of Arcot, South,	,, 27th February	,,	,,	70.
,, ,,	of Bellary,	,, 25th March	,,	,,	1050.
,, ,,	of Chingleput,	,, 20th February	,,	,,	75.
,, ,,	of Coimbatore,	,, 4th May	,,	,,	91.
,, ,,	of Cuddapah,	,, 2nd March	,,	,,	84.
,, ,,	of Kurnool,	,, 19th February	,,	,,	84.
,, ,,	of Madura,	,, 22nd March	,,	,,	125.
,, ,,	of Malabar,	,, 28th ,,	,,	,,	953.
,, ,,	of Salem,	,, 27th February	,,	,,	441.
,, ,,	of Tanjore,	,, 27th ,,	,,	,,	1054.
,, ,,	of Tinnevelly,	,, 25th ,,	,,	,,	122.
,, ,,	of Trichinopoly,	,, 8th June	,,	,,	1654.

Resolution—dated 7th January 1884, No. 15.

In paragraph 8 of Proceedings, No. 92, dated 14th January 1882, the Board suggested that agricultural exhibitions should be held in the vicinity of a railway, and should be arranged so as to fall in with some popular time and place of pilgrimage or fair. Srírangam, Tiruvannámalai and Bellary (for Hampi) were mentioned, and all Collectors of railway districts were requested to report regarding any localities which they might deem suitable.

2. *Anantapur.*—Mr. Roupell says that there is no locality in his district suitable for an exhibition.

Arcot, North.—Mr. Whiteside recommends that Vellore be selected. It is on the line of rail and is accessible by road.

Arcot, South.—Mr. Cruickshank says that the Kartigai Fair at Tiruvannámalai is held between 14th November and 3rd December, which is not a suitable season for an exhibition. He therefore suggests that the show be held in the month of Masi (11th February to 13th March) on the open plain near the Collector's office, apparently at Cuddalore.

Bellary.—Mr. Gordon states that the Hampi festival takes place between 27th March and 24th April, a season when the weather is hot, shelter is difficult to obtain, water is scarce and fodder is dear. He is reluctant to run the risk of introducing cholera into the Bellary Cantonment, and suggests that Gooty is a preferable locality.

Chingleput.—Mr. Price says that Chingleput is the most central place, but there is no tope there and no large festivals. Near Conjeeveram there is a tope and a festival occurs there at the end of May, but then Conjeeveram is extremely hot and the festival is entirely religious and is not a fair. There is a good tope a mile and a half from Tiruvallúr, where there is a festival every new moon.

The Collector, however, does not think that an agricultural exhibition, in addition to that held at Saidápet, is called for in Chingleput district, where agriculture is backward and the cultivators are for the most part sub-tenants of absentee landlords.

Coimbatore.—Mr. Leman suggests Erode, then Coimbatore, and lastly Karúr.

Cuddapah.—Mr. Burrows suggests that the exhibition be held at Cuddapah during the Christmas holidays.

Kurnool.—Mr. Glenny says that the products of his district can most conveniently be shown at Bellary.

Madura.—Mr. H. J. Stokes suggests that the exhibition be held at Madura during the Alagar festival in Chittrai (April-May).

Malabar.—Mr. McWatters says that there is an annual car festival at Pálghat, where there is ample accommodation. The largest market in Malabar is at Vaniamkulam, but space and accommodation there are not equal to what can be had at Pálghat.

Salem.—Mr. H. E. Stokes says that there is no suitable locality in the district.

Tanjore.—Dr. Buick suggests Tanjore, and also Kumbakónam where there is a great influx of visitors during February and March.

Tinnevelly.—Mr. Pennington thinks that Srírangam is the most convenient situation in Southern India, but considers that the exhibitions must be District Exhibitions, that they should be commenced only in districts where the Collector is prejudiced in their favor, and that they should not be contemporary with festivals for fear of epidemics. Mr. Pennington does not mention any suitable locality in Tinnevelly.

Trichinopoly.—Mr. H. Sewell considers that Srírangam is altogether unsuited for the site of an exhibition. It is full of gardens and wet cultivation, there is no open space in or about the place, the bed of the river is not fitted for the erection of temporary sheds, and the great festival falls at the end of December or beginning of January, before harvest, and usually brings cholera. The Collector suggests Trichinopoly, in March, before water becomes scarce.

3. The Board are of opinion that Salem, Vellore, Cuddalore, Trichinopoly, Madura, Pálghat and Coimbatore are all eligible places to the south of Madras for holding exhibitions. To the north of Madras, however, the only eligible place which can at present be reached by rail seems to be Gooty. They would suggest therefore that District Exhibitions be held—

In 1884 at Gooty and Coimbatore,
In 1885 at Gooty and Salem,
In 1886 at Gooty and Cuddalore,
In 1887 at Gooty and Trichinopoly,
In 1888 at Gooty and Vellore,
In 1889 at Gooty and Madura,
In 1890 at Madras.

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If in the meanwhile the railway is completed from Tirupati to Nellore, an exhibition or two might be held at Nellore instead of at Gooty.

(A true Copy and Extract.)

(Signed) E. GIBSON,
Acting Secretary.

To the Secretary to Government, Revenue Department, with fourteen original letters to be returned.

Copy to all Collectors of Railway Districts.
,, to the Director of Revenue Settlement and Agriculture.

Order—dated 30th January 1884, No. 146, Revenue.

Miscellaneous.

The Board's recommendations are accepted, and their further proposals awaited.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue, with fourteen enclosures.
,, the Director of Revenue Settlement and Agriculture.
,, the Financial Department.

Exd. W. H. French.

80 Copies

In No 393/84

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 30th January 1884, No. 146.

JANUARY.

Agricultural Exhibitions.

Board's recommendations regarding localities at which — should be held, accepted, with remarks.

No 409

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 14 February 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Reve: Settt.
Party No III

6TH FEBRUARY 1884, No. 190, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, to the Secretary to Government, Revenue Department, dated Madras, 2nd February 1884, No. 287-11:—

I have the honor in reply to G.O., No. 147, dated 30th ultimo, to inform you that Mr. Horne may be attached to No. III Settlement Party now working in Madura on the expiry of his survey course with No. III Survey Party.

ORDER—dated 6th February 1884, No. 190, Revenue.

Miscellaneous.	Sanctioned accordingly.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Accountant-General.
,, the Public Department.
,, the Collector of Ganjam.

Exd. W. H. French.

80 Copies.

Inv No 474/

Govt. of {1884} Madras

REVENUE.

No 503/25

Communicated to the Deputy Director of Revenue Settlement of No III Party

(By order)

[signature]

1st Assistant

Dept. of Reve: Settl. & Agriculture }
Madras 16th February 1884 }

Issued

Recd. *Encl.*

G.O., 6th February 1884, No. 190.

FEBRUARY.

Mr. W. O. Horne

Assistant Collector, Ganjam.—Ordering that — be attached to No. III Settlement Party at the end of his survey course.

1

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following endorsement by W. WILSON, Esq., Director of Revenue Settlement and Agriculture, dated Madras, 10th December 1883, No. 1771, on the following letters :—

1.—Letter from W. R. ROBERTSON, Esq., M.R.A.C., Agricultural Reporter to the Government of Madras, to the Director of Revenue Settlement and Agriculture, dated Saidápet, 14th November 1883, No. 2017 :—

In reply to your Proceedings, No. 1545, dated the 9th instant, calling for any remarks I may have to offer on G.O., No. 1194, of the 26th September last, I have the honor to observe that the Agri-Horticultural Society have, during the past eight or ten years, apparently confined their operations more closely to arboriculture and horticulture than to agriculture, and probably with the small means at their disposal, this was the best policy they could have pursued. While this department remained under my immediate charge, my endeavor was to confine our work as much as possible to matters strictly agricultural, and unless the grant to the Society is to be largely increased, it seems to me that the division of work indicated, may well continue to be observed between the Society and ourselves.

2. As regards your second paragraph, you are under a misapprehension in your supposition that the experimental and botanical grounds at Saidápet, maintained at the expense of the School of Agriculture, resemble the "valuable and extensive botanical gardens maintained by the Agri-Horticultural Society." Our grounds are on a very small scale and are devoted chiefly to the production of specimens of different plants that yield fibre, sugar, oil, dye, starch-fodder, &c., which are the subjects of lectures in the agricultural and the botanical courses in the college. The grounds are also utilised for small plots of experimental crops that cannot be grown in the open fields; thus we are conducting several small experiments in these grounds in connection with the inquiry into the causes of the varying color of Nankin cotton fibre—*vide* G.O., No. 1148, dated 19th September last; in connection with an inquiry regarding the habits and feeding values of indigenous grasses, we are growing small plots of native grasses; the mulberry leaves to be used in the silk-worm experiment are being grown in these grounds; the small experiment with variety of Nankin cotton ordered in G.O., No. 2032, dated the 17th May last, is going on in these grounds; also an experiment in growing salt-bush, the *Withama coagulans*, Eucalypti, &c. The small manuring experiments "cattle dung and ash" and others of the kind, impossible to carry out in the fields, are also going forward in these grounds. All these experiments must be discontinued if the grounds are to be abandoned.

3. From a financial as well as an educational point of view, the grounds are a great advantage to the School of Agriculture. The botanical lecturer holds on the average twelve out-of-door classes monthly in these grounds. If these classes were to be held at Tenampet, we could not do less than pay the lecturer's carriage hire, say Rs. 30 a-month, and if we followed the usual custom, we should also have to pay jutka hire for conveying the students to and from Tenampet, which, as we have about ninety students, would cost at the least Rs. 150 a month. The Tenampet gardens are upwards of two miles from the college, while our grounds are not 200 yards away. Most of the students pass through the latter daily; whereas but few, I,

fear, would ever voluntarily visit the Tenampet gardens. We do utilise these gardens as far as we can, one or two botanical classes being held in them during a season. Were the students to walk to and from the Tenampet gardens, at least 1½ hours would thus be wasted each time a class was held there, which would seriously interfere with the work of the day; and it must be remembered that each student has already two-hour active out-of-door duty each morning in farm, surveying, and other classes; and many of them have considerable distance to walk in attending lectures at the college in the mornings and afternoons.

4. The net cost of our grounds is less than Rs. 50 a month, and will be less when the fruit trees come into full bearing, and at the small cost we gain the advantages before alluded to, can keep the botanical lecturer well supplied with fresh specimens, and we are gradually forming a useful collection of trees and shrubs of some of which there are no specimens in the Tenampet gardens. The grounds have been laid out specially for the use to which they are now devoted, and all initial expenses in laying out foot-paths, terracing, providing irrigation means, &c., have been incurred. As I have shown, the cost of upkeep will probably not exceed in amount the sum that would have to be paid the botanical lecturer in carriage hire only were his classes to be held at Tenampet instead of at Saidápet, while he might demand a fee for each gathering, as his present lecture fee covers only out-of-door classes in *continuation* of his lectures.

5. From every point of view I am of opinion that our experimental and botanical grounds must be maintained.

2.—Letter from JOSEPH STEAVENSON, Esq., Honorary Secretary, Agri-Horticultural Society, to the Director of Revenue Settlement and Agriculture, dated Madras, 5th December 1883, No. 1288 :—

With reference to your letter of the 9th November 1883, I have the honor to forward herewith, by direction of the Committee, a copy of a resolution passed at their meeting held on the 4th instant, for your information.

ENCLOSURE.

I. Resolved that copies of Volumes I and II, new series, and Mr. Shaw's Synopsis of the proceedings of the Society be presented to the library of the Director of Revenue Settlement and Agriculture, and that his name be included in the Society's distribution list.

Resolved also that this Committee will at all times be glad to be of any assistance to the Agricultural Department, and will cordially do its utmost to "usefully co-operate" with it, agreeably to the wishes of the Governments of India and of Madras, particularly in the directions indicated by paragraph 2 of the resolution of the Government of Madras recorded above.

Resolved also that this Committee sees no advantage to be gained by making the Department of Revenue Settlement and Agriculture "the channel of its communications with Government" but rather the reverse, and should much prefer, so long as Government will permit, to communicate direct, as it has been accustomed to do for the last 48 years, as it believes to the great material advantage of the country.

With reference to the suggestion that the Botanical Garden at Saidápet might be done away with, this Committee would wish to place upon record an expression of their regret that any such retrogressive step should be seriously contemplated, as, it believes, that, though the scientific garden maintained by the Society is now in a high state of efficiency, and is resorted to by large and increasing numbers of students, the sources of information on a subject of such inestimable value to the people cannot be too numerous nor the facilities of referring to them too great.

Endorsement, No. 1771.

Submitted to Government with copy of a letter No. 2017, dated 14th November 1883, from the Agricultural Reporter in reference to G.Os., Nos. 1194, 1194A and 1412, dated 26th September and 15th November 1883.

2. The botanical grounds at Saidápet are not botanical merely—they are maintained chiefly for experimental purposes and cannot therefore be abandoned.

3. In reference to the 4th paragraph of the Agri-Horticultural Society's resolution, it is observed that the suggestions made in this office letter No. 1545, dated 9th November 1883, to the address of the Secretary were not made in any spirit of retrogression, but in what was believed to be the interests of progress. It was thought that by concentrating energy power would be increased and progress helped not hindered. Thus the attention of the Society might well be specially devoted to arboriculture, including fibre-growth and experiments, horticulture and the distribution of seeds and plants, agricultural matters proper being dealt with by the Agricultural Department.

To the Secretary to Government, Revenue Department.

ORDER—dated 18th January 1884, No. 81, Revenue.

Miscellaneous.

Recorded.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Honorary Secretary, Agri-Horticultural Society.
,, the Board of Revenue.

Exd. W. H. French.

70 Copies.

No. 354/84

Govt. of {1884} Madras.

REVENUE.

No. 436

ommunicated to the Officers in charge of Settlement Parties, to e Agricultural Reporter and to the Inspector of Cattle Diseases.

ept. of Rev. Sett. & Agre.
adras 19 February 1884

(By order)

[signature]
1st. Assistant

To
The Dy. Director of Reve: Settt
Party No. III

Issued

Recd. *Encl.*

G.O., 18th January 1884, No. 81.

JANUARY.

Botanical Gardens

maintained by the Agri-Horticultural Society and at the Saidápet Farm.—Proceedings of the Director of Agriculture submitting papers regarding the —, recorded.

6th February 1884, No. 179, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 16th January 1884, No. 126:—

Read—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Secretary to the Board of Revenue, dated 6th December 1883, No. 3160-73:—

I have the honor to submit a revised settlement standard scale of dry rates, which I request the Board will be pleased to have substituted for that forwarded with this office No. 2447-47, dated 9th August 1879, recorded in Board's Proceedings, No. 2473, dated 28th August 1879.

2. On further examination of the scale I find that, by an oversight, the relative positions of the soils III-1, black clay, and IV-1, black loam, have been transferred, IV-1 being shown as a superior soil to III-1: it is so for irrigation and in some recent settlements it has, I find, been taken as equal to III-1 for dry cultivation, but there can be no question that for dry cultivation the stiff clay of III-1 is a better soil than the opener soils classed as IV-1. It was probably owing to IV-1 being classed higher than III-1 in the *wet* scale that the mistake was made in drawing the dry one.

3. I find also that the scale makes no provision for three and four-rupee rates that are not uncommon in our settlements for III-1 and IV-1 soils. These omissions and mistakes I have now corrected. They do not in any way affect the proposals made for Madura, the only district to the settlement of which the standard scale has been as yet applied.

Enclosure.

Table of Money Rates for Dry Lands.

Classification.		Rate per Acre.									
Class.	Sort.	Taram.	1st Group.	Taram.	2nd Group.	Taram.	3rd Group.	Taram.	4th Group.	Taram.	5th Group.
1		2		3		4		5		6	
			RS. A. P.		RS. A. P.		RS. A. P.		RS. A. P.		RS. A. P.
II	1	1	5 0 0	2	4 0 0	3	3 8 0	4	3 0 0	5	2 8 0
II .. .. .. III	2 1	2	4 0 0	3	3 8 0	4	3 0 0	5	2 8 0	6	2 0 0
III .. .. .. IV	2 1	3	3 8 0	4	3 0 0	5	2 8 0	6	2 0 0	7	1 8 0
III .. .. .. IV .. .. .. VII	3 2 1	4	3 0 0	5	2 8 0	6	2 0 0	7	1 8 0	8	1 0 0
III .. .. .. IV .. .. .. V .. .. .. VI .. .. .. VII .. .. .. VIII .. .. .. XII	4 3 1 1 2 1 1	5	2 8 0	6	2 0 0	7	1 8 0	8	1 0 0	9	0 12 0

Table of Money Rates for Dry Lands—(*Continued*).

Classification.		Rate per Acre.									
Class.	Sort.	Taram.	1st Group.	Taram.	2nd Group.	Taram.	3rd Group.	Taram.	4th Group.	Taram.	5th Group.
1		2		3		4		5		6	
			RS. A. P.		RS. A. P.		RS. A. P.		RS. A. P.		RS. A. P.
III	5	6	2 0 0	7	1 8 0	8	1 0 0	9	0 12 0	10	0 8 0
IV	4										
V	2										
VI	2										
VII	3										
VIII	2										
XII	2										
XIII	1										
IV	5	7	1 8 0	8	1 0 0	9	0 12 0	10	0 8 0	11	0 6 0
V	3										
VI	3										
VII	4										
VIII	3										
XII	3										
XIII	2										
XIV	1										
V	4	8	1 0 0	9	0 12 0	10	0 8 0	11	0 6 0	12	0 4 0
VI	4										
VII	5										
VIII	4										
XII	4										
XIII	3										
XIV	2										
V	5	9	0 12 0	10	0 8 0	11	0 6 0	12	0 4 0	12	0 4 0
VI	5										
VIII	5										
XII	5										
XIII	4										
XIV	3										
XIII	5	10	0 8 0	11	0 6 0	12	0 4 0	12	0 4 0	12	0 4 0
XIV	4										
XIV	5	11	0 6 0	12	0 4 0	12	0 4 0	12	0 4 0	12	0 4 0

Resolution—dated 16th January 1884, No. 126.

Submitted for the information of Government, with reference to the correspondence ending with G.O., dated 6th September 1882, No. 944.

2. The revised table of settlement standard rates received with the Director's letter will be substituted for those printed with the Board's Proceedings, dated 28th August 1879, No. 2473.

(True Copies and Extract.)

(Signed) E. GIBSON,
Secretary.

To the Secretary to Government, Revenue Department, with copy of Board's Proceedings, dated 28th August 1879, No. 2473.

Copy to the Director of Revenue Settlement and Agriculture.
" " Collector of North Arcot.
" " Superintendent, Revenue Survey.

ENCLOSURES.

Proceedings of the Board of Revenue, dated 28th August 1879, No. 2473.

Read the following letter from C. RUNDALL, Esq., Deputy Director of Revenue Settlement, North Arcot, to W. WILSON, Esq., Director of Revenue Settlement, Madras, dated Chittoor, 21st July 1879, No. 393-160 :—

With reference to your endorsement, No. 2059-330, of the 4th instant, desiring information as to when a settlement scheme for North Arcot may be expected to be submitted to the

Central office, I have the honor to state that, as informed by No. 1959-321, dated the 27th ultimo, the survey area lists will not all be furnished for the Chittoor taluk till the end of October. It will probably take until November to close the final revision of classification of the Wálajápet taluk, &c.; and therefore it is unlikely that the scheme can be matured and submitted until early next year.

No. 2447-47.

Submitted to the Board of Revenue in continuation of this office No. 2336A-44, dated 31st ultimo.

2. Having regard to the slow progress of ordinary and orthodox settlement preliminary operations, Mr. Puckle has suggested that the experience of the department with its twenty-one already sanctioned schemes should now suffice to determine without any preliminary inquiry what should be adopted as the table of money rates to be applied to any new district, the assessment of which is proposed for revision.

Against this it may be urged that—

(1) The assessment of land being the commuted value of a definite share of its produce, it is impossible to determine the assessment without first ascertaining the produce, and this should be done by independent inquiry.

(2) It would be wrong to apply to a new district without inquiry any table of rates however framed, for the suitability of the table must be ascertained, and this can only be done by inquiry, which again must be directed to either the productive powers of the soil, or a consideration of the range and incidence of present assessments: the former method of inquiry is that hitherto adopted but now objected to on account of the tediousness of its processes: the latter would nearly result in a redistribution of the existing demand.

3. To these objections it may be answered that the districts that have been already settled embrace every variety of climate, soil, and product in the presidency, and that it may be confidently predicated that any scale to be worked out hereafter by the ordinary methods of the department will fall within the limits of the scales already adopted for other districts. Besides, the rates worked out in the ordinary way for one part of a district have already in several cases been applied without further inquiry to the rest of it: the same method of settlement will be adopted for the southern taluks of Coimbatore, for the Tamil portion of North Arcot, and for three of the taluks of the sub-division of Cuddapah. If then there is no impropriety in applying general knowledge to the settlement of one part of a district on the experience of another, there can be none in the application of general knowledge to the settlement of the four districts for which schemes have yet to be submitted on the experience of the department gained in the greater part of the presidency. There would be no impropriety, therefore, in framing on the experience of the department a *standard* scale of rates to be applied without further inquiry to the districts still to be settled.

This standard must be based either on the *average* of all the rates hitherto adopted, or must be an *arbitrary* scale that will embrace and provide for all rates which on the experience of the department can be regarded as probable.

4. The result of settlement operations so far has been the application of thirty-four rates varying from Rs. 12 to Re. 1 in "Wet" and of twenty-seven varying from Rs. 20 * to As. 4 in "Dry." Excluding Ganjam, where the highest wet rate was exceptionally low, Rs. 5-8-0, the highest settlement "Wet" rate is on the average Rs. 9-12-8, say Rs. 10, and excluding the Godávari special rates the highest "Dry" Rs. 4-4-0, say Rs. 4. Assuming that no "Wet" rate should be less than Rs. 2, the average of settlements would give scales ranging from Rs. 10 to 2 in "Wet" and from Rs. 4 to As. 4 in "Dry."

* Special rate for Godávari islands.

Now it is at once obvious that a wet scale having for its highest limit Rs. 10 would not satisfy the requirements of the best lands under the Pálár and Poiney anicuts in North Arcot, and the Pelandorai anicut in South Arcot, which are quite as able to bear rates of Rs. 12 and 10-8-0 as the Bhávani channel lands of Coimbatore and the Tamrapurni valley of Tinnevelly. Nor again would a dry scale ranging from Rs. 4 to As. 4 sufficiently meet the case of the best dry lands in those four districts, which are as able to bear a Rs. 5 rate as the best in Nellore, Cuddapah, Salem, Tinnevelly, and the Godávari. Scales framed on the *average* of previous settlements must therefore be rejected because of their insufficiency, and an *arbitrary* scale embracing the most salient feature of all must be adopted; for this purpose the following scales, ranging from Rs. 12 to Rs 2 in wet and from Rs. 5 to As. 4 in dry, will, it is believed, embrace and provide for every possible scale that could by the ordinary methods of the department be worked out for any of these districts. The adoption of these standards would reduce settlement operations broadly to classification and introduction, and would probably affect materially the strength of settlement establishment, if not indeed the constitution and continued existence of the department.

(Signed) W. WILSON,
Director of Revenue Settlement.

OOTACAMUND,
9th August 1879.

To the Secretary to the Board of Revenue.

Table of Money Rates for Wet Lands.

Wet.

Classification.		Rate per Acre.									
Class.	Sort.	Taram.	1st Group.	Taram.	2nd Group.	Taram.	3rd Group.	Taram.	4th Group.	Taram.	5th Group.
1		2		3		4		5		6	
			RS. A.		RS. A.		RS. A.		RS. A.		RS. A.
IV.	1	1	12 0	2	10 8	3	9 0	4	8 0	5	7 0
III. IV. VII.	1 2 1	2	10 8	3	9 0	4	8 0	5	7 0	6	6 0
III. IV. V. VI. VII. VIII. XII.	2 3 1 1 2 1 1	3	9 0	4	8 0	5	7 0	6	6 0	7	5 0
III. IV. V. VI. VII. VIII. XII. XIII.	3 4 2 2 3 2 2 1	4	8 0	5	7 0	6	6 0	7	5 0	8	4 8
III. IV. V. VI. VII. VIII. XII. XIII. XIV.	4 5 3 3 4 3 3 2 1	5	7 0	6	6 0	7	5 0	8	4 8	9	4 0
III. V. VI. VII. VIII. XII. XIII. XIV.	5 4 4 5 4 4 3 2	6	6 0	7	5 0	8	4 8	9	4 0	10	3 8
V. VI. VIII. XII. XIII. XIV.	5 5 5 5 4 3	7	5 0	8	4 8	9	4 0	10	3 8	11	3 0
XIII. XIV.	5 4	8	4 8	9	4 0	10	3 8	11	3 0	12	2 8
XIV.	5	9	4 0	10	3 8	11	3 0	12	2 8	13	2 0

9th August 1879.

(Signed) W. WILSON,
Director of Revenue Settlement.

Table of Money Rates for Dry Lands.

Dry.

Classification.		Rate per Acre.					
Class.	Sort.	Taram.	1st Group.	Taram.	2nd Group.	Taram.	3rd Group.
1		2		3		4	
			RS. A.		RS. A.		RS. A.
II	1	1	5 0	2	3 8	3	2 8
II ... ... IV	2 1	2	3 8	3	2 8	4	2 0
III ... ... IV ... ... VII	1 2 1	3	2 8	4	2 0	5	1 8
III ... ... IV ... ... V ... ... VI ... ... VII ... ... VIII ... ... XII	2 3 1 1 2 1 1	4	2 0	5	1 8	6	1 0
III .. ... IV ... ... V ... ... VI ... ... VII ... ... VIII ... ... XII ... ... XIII	3 4 2 2 3 2 2 1	5	1 8	6	1 0	7	0 12
III ... ... IV ... ... V ... ... VI ... ... VII ... ... VIII ... ... XII ... ... XIII ... ... XIV	4 5 3 3 4 3 3 2 1	6	1 0	7	0 12	8	0 8
III ... ... V ... ... VI ... ... VII ... ... VIII ... ... XII ... ... XIII ... ... XIV	5 4 4 5 4 4 3 2	7	0 12	8	0 8	9	0 6
V ... ... VI ... ... VIII ... ... XII ... ... XIII ... ... XVI	5 5 5 5 4 3	8	0 8	9	0 6	10	0 4
XIII ... ... XIV	5 4	9	0 6	10	0 4	10	0 4
XIV	5	10	0 4	10	0 4	10	0 4

(Signed) W. WILSON,
Director of Revenue Settlement.

With this letter the Director of Revenue Settlement submits a report from Mr. Rundall to the effect that a scheme for the settlement of North Arcot cannot be expected till early next year, partly owing to the want of survey areas for some villages of Chittoor, and partly owing to the slow progress of the detailed classification of Wallajah.

2. The comparison of survey and curnams' areas for every field of every village however is not needed to work out a scheme, and the Board will be prepared to receive percentage estimates of area for some of the villages framed on the ascertained average of the bulk of the villages for which areas have already been furnished ; in the same way the classification can be expedited by leaving some details to be attended to later, and the Board look to the Director to place this scheme with his comments upon it in their hands before the end of the current calendar year. The subject-matter of the Director's memorandum will be dealt with when the North Arcot scheme is before the Board.

(True Copies and Extract.)

(Signed) C. A. GALTON,
Acting Secretary.

To the Director of Revenue Settlement.
Copy to the Collector of North Arcot.
,, ,, Superintendent of Revenue Survey.

ORDER—dated 6th February 1884, No. 179, Revenue.

Land Revenue, No. 24,

Approved.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.

Exd J. Henricus.

60 Copies.

In no. 459/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 6th February 1884, No. 179.

No 516/26

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre. Madras 18 February 1884

(By order)

Sheppard

1st. Assistant

To
The Dy Director of Reve: Sett.
Party No III

FEBRUARY.

Revenue Settlement.

Revised standard table of rates for dry lands in districts remaining to be brought under — forwarded by the Director, approved.

To be substituted for the Progs: of the same date and numbe

18th January 1884, No. 86, Revenue.

Rep ...

291

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—again G.O., dated 16th March 1881, No. 453, Revenue :—

Abstract.—Passing orders on Revenue Board's Proceedings submitting letter from Commissioner recording his opinion as to the way in which the settlement of lands on the Nílgiris should be conducted.

Order—dated 18th January 1884, No. 86, Revenue.

Land Revenue, No. 11.

In consequence of the small amount of available waste remaining in the settlements of Ootacamund, Coonoor, and Wellington, and in view of the probable requirements of Government, the Right Honorable the Governor in Council is pleased to direct that rules X and XVI of the Settlement Rules for the Nílgiri Hills shall be held inapplicable to the settlements above named, save in cases in which applications for settlement grants had been already registered, and that in the latter cases no grant exceeding 10 acres shall in any case be allowed, and none without special reference to the Collector. He further directs that no applications for the sale of such land under the Waste Land Rules within the said settlements shall be entertained without the previous sanction of Government obtained on a special recommendation of the Collector in the first instance.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, Board of Revenue.
,, Collector of Nílgiris.
,, Public Works Department.

No. 191

x x x x

2. Copy also to the officers in charge of other parties

(By order)

[signature]
1st Assistant

Exd. J. Henricus.

70 Copies.

Dept. of Reve: Sett. and Agriculture
Madras 23rd January 1884
O 20 July

To

The Dy. Director of Reve: Sett
No. III Party

Ins No 189/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. *Encl.*

G.O., 18th January 1884, No. 86.

JANUARY.

Rules for the Settlement of Lands on the Nilgiri Hills.

Declaring that rules X and XVI be held inapplicable to the settlements of Ootacamund, Coonoor and Wellington, save in certain cases, and issuing instructions in regard to the disposal of applications for grants of waste lands in those settlements.

Reg no. 20

21st January 1884, Nos. 100, 100A, Revenue.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Secretary to Government, Revenue Department, dated 3rd December 1883, No. 85:—

I have the honor to submit an abstract statement showing the irrigable area, the occupation, the actual irrigation, the assessment and the actual revenue derived from the various classes of Irrigation works in the Madras Presidency in 1882-83.

2. The statement embraces four classes of works, viz:—

(1) Productive public works for which capital and revenue accounts are kept. These are five in number affecting six districts, viz., Godávari, Kistna, Tanjore, Trichinopoly, Nellore and Tinnevelly.

(2) Agricultural works for which capital and revenue accounts are kept. These are four in number affecting three districts, viz., North Arcot, Chingleput and South Arcot.

(3) Agricultural works for which a continuous record is maintained. These are 59 in number and are distributed over nine districts, viz., Vizagapatam, Kurnool, Chingleput, North Arcot, South Arcot, Tanjore, Tinnevelly, Salem and Coimbatore.

(4) Agricultural works for which capital and revenue accounts are not kept and which are accounted for not individually but collectively by districts.

This class is subdivided into Major and Minor, the former embracing all works irrigating Acres 200 and over, the latter all works irrigating less than 200 acres. There are 2,872 "Major" works and 28,776 "Minor" works distributed as in the margin.

Districts.	Major. RS.	Minor. RS.
Ganjam	215	2,654
Vizagapatam	24	420
Godávari	110	1,205
Kistna	190	248
Nellore	209	563
Kurnool	46	671
Anantapur	101	1,495
Bellary	131	898
Cuddapah	156	2,950
North Arcot	171	3,906
Chingleput	545	2,090
South Arcot	246	2,849
Tanjore	52	607
Trichinopoly	148	1,134
Madura	207	1,911
Tinnevelly	174	1,739
Coimbatore	69	242
Salem	78	3,194
Total ...	2,872	28,776

3. In the abstract works under Classes I and II are separately accounted for, works under Classes III and IV, for which detailed accounts have been already submitted to Government in the Public Works Department, are not separately shown: those under Class IV are divided into "Major" and "Minor."

4. The irrigable area under all classes of works was, according to the revenue records, Acres 5,055,111: of this Acres 4,604,402 or 91 per cent. were occupied and Acres 4,372,347 or 86 per cent. were effectively irrigated for one crop, while Acres 868,603 or 17 per cent. were effectively irrigated for a second crop also.

5. The area commanded by works of Class I was Acres 2,030,517 or 40 per cent. of the total irrigable area: that under works of Class II was Acres 100,378 or 2 per cent.; that under Class III works was Acres 357,256 or 7 per cent., while under the works of Class IV there were Acres 2,566,960 or 51 per cent., that is more than half of the whole irrigable area. Of the 2,566,960 acres commanded by works of Class IV, Acres 1,237,548 or 49 per cent. fall under "Major" and the remainder Acres 1,329,412 or 51 per cent. under "Minor" works. The "Major" works are controlled by the Public Works Department, the "Minor" are managed in the Revenue Department.

6. Of the occupied area there were effectively irrigated under Class I works Acres 1,741,441 or 33 per cent. for one crop and Acres 155,878 or 3 per cent. for a second crop: these together, Acres 1,897,319, amounted to 36 per cent. of the total effective irrigation of the year under all sources. Under Class II works the effective irrigation for single and double crop was Acres 116,755 or 2 per cent.; under works of Class III the area was Acres 447,553 or 9 per cent., and under works of Class IV the area effectively irrigated was 2,779,323 acres or 53 per cent. of the total effective irrigation of the year.

These figures abundantly show the importance to the public revenue of the works included in Class IV.

7. The total revenue—land and water—dependent on all classes of works was Rs. 215,26,810: of this Rs. 56,24,002 or 26 per cent. represent land revenue proper, and Rs. 159,02,808 or 74 per cent. the revenue due to irrigation. About three-fourths of the total revenue dependent on works of irrigation is thus due to irrigation.

8. Of the total revenue, Rs. 83,94,168 or 39 per cent. were dependent on works of Class I, Rs. 4,00,693 or 2 per cent. on works of Class II, Rs. 22,91,417 or 11 per cent. on works of Class III, and Rs. 104,40,532 or 48 per cent. on works of Class IV.

The revenue Rs. 83,94,168 dependent on Class I works was composed of Rupees 23,26,315 or 28 per cent. land revenue proper, and Rs. 60,67,853 or 72 per cent. revenue due to irrigation.

The revenue Rs. 4,00,693 under Class II works embraced Rs. 1,01,106 or 25 per cent. of land revenue proper, and Rs. 2,99,587 or 75 per cent. of revenue due to irrigation.

The revenue Rs. 22,91,417 under Class III works comprised Rs. 5,27,391 or 23 per cent. of land revenue proper, and Rs. 17,64,206 or 77 per cent. of revenue due to irrigation, while the revenue dependent on works of Class IV comprised Rs. 26,69,190 or 26 per cent. of land revenue proper, and Rs. 77,71,342 or 74 per cent. of revenue due to irrigation.

9. The total of the remissions granted in the year was Rs. 15,00,857, being 7 per cent. of the total assessment and 9½ per cent. of the total irrigation revenue to which the remissions are debited. Of this Rs. 3,67,485 or 2 per cent. of the total irrigation revenue were granted under Class I works, Rs. 4,230 or 0 per cent. under Class II works, Rs. 75,041 or 5 per cent. under Class III works, and Rs. 10,54,101 or 7 per cent. under Class IV works.

10. The percentage of remissions to irrigation revenue under each class of works was as follows:—

Class	I	6 per cent.
,,	II	1½ ,,
,,	III	4¼ ,,
,,	IV	14 ,,

The percentage of remissions under Class I works in the year under review was heavy: in no year of the preceding five did the percentage exceed 4½, while the average for the five years was 3⅔. The heavy remissions of the past year under this class of works were for the most part granted under the Kistna and Godávari systems where there were heavy losses from flood.

The percentage of remissions under Class II works was less last year than in any of the five years that preceded it. In none of those years was the percentage less than $3\frac{1}{4}$, and in one of them, a famine year, 1877-78, it was as high as $10\frac{3}{4}$: the average for the five years was 6.

The past years' record of Class III works is not yet quite complete so that I am unable to compare the percentage of the remissions under them last year with the percentage during the previous five.

This is the first year in which the revenue under Class IV works has been tabulated and distributed as for the greater systems of the Presidency between "land" and "water." There is therefore nothing to compare the percentage of remission under them this year with what it was in any year before it. The loss, 14 per cent. of the irrigation revenue, is heavy and is doubtless due in great part to the disrepair of the works very many of which have received but little attention for years. The loss under the "Major" works of this class was 11 per cent., and under the "Minor" works was 16 per cent. of their irrigation revenue. This represented the lost revenue on lands in actual occupation, but besides that there was the lost assessment of 205,992 acres of land left waste and unoccupied under this class of works. This assessment is not recorded in our accounts; but, taking its rate at three-fourths of the average, Rs. 4 an acre of the occupied lands, it would amount to Rs. 6,18,000 a year. Together with remissions therefore, the annual loss of revenue under Class IV works, which is by far the most numerous class of works in the Presidency, may be reckoned at not less than $16\frac{1}{2}$ lakhs of rupees, as the marginal figures will show.

—	Area unoccupied.	Three-fourths of the average assessments.	Actual remissions.	Total.
	ACS.	RS.	RS.	RS.
Major ..	1,36,280	4,08,840	4,21,645	8,30,485
Minor ..	69,712	2,09,136	6,32,456	8,41,592
Total ..	2,05,992	6,17,976	10,54,101	16,72,077

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Statement showing the Irrigable Area, the occupied Area and the Area actually irrigated under, together with the Revenue dependent on, and the actual Revenue derived from, the various Classes of Irrigation Works in the Madras Presidency in Fasli (1292) 1882-83.

Works.	Irrigable Area.	Occupied Area.		Area effectively irrigated.			Revenue dependent on Irrigation Works.			
		First Crop.	Second Crop.	First Crop.	Second Crop.	Total.	Land.	Water. First Crop.	Water. Second Crop.	Total Land and Water.
1	2	3	4	5	6	7	8	9	10	11
	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	RS.	RS.	RS.	RS.
Class I—Productive Public Works for which Capital and Revenue Accounts are kept.										
1. Godávari Anicut	612,000	528,149	31,831	504,213	31,183	535,396	6,88,613	16,04,823	99,816	23,93,252
2. Kistna do.	415,000	287,084	79	261,158	79	261,237	3,51,225	9,76,410	168	13,27,803
3. Cauvery do.	906,017	906,017	107,076	892,871	106,344	999,215	11,96,907	27,13,938	2,48,910	41,59,755
4. Pennér do.	64,000	64,302	625	63,653	625	64,278	64,495	2,37,162	1,810	3,03,467
5. Srívaikuntham Anicut	33,500	21,677	18,836	19,546	17,647	37,193	25,075	1,24,528	60,288	2,09,891
Total ..	2,030,517	1,807,229	158,447	1,741,441	155,878	1,897,319	23,26,315	56,56,861	4,10,992	83,94,168
Class II—Agricultural Works for which Capital and Revenue Accounts are kept.										
1. Pálár Anicut	66,750	66,751	20,652	66,212	20,584	86,796	68,971	1,75,448	45,524	2,89,943
2. Chembrambaukam Tank	18,000	12,767	3,216	12,763	3,216	15,979	17,639	39,354	8,942	65,935
3. Pelandorai Anicut	7,541	3,461	174	3,386	174	3,560	5,838	8,787	389	15,014
4. Madras Water-supply and Irrigation Extension Project ..	8,087	7,437	2,985	7,435	2,985	10,420	8,658	16,186	4,957	29,801
Total ..	100,378	90,416	27,027	89,796	26,959	116,755	1,01,106	2,39,775	59,812	4,00,693
Class III—Works for which individually a continuous record is maintained.										
Total ..	357,256	345,789	104,869	342,684	104,869	447,553	5,27,391	13,99,262	3,64,764	22,91,417
Class IV—Works for which individually no account is required but which will be accounted for collectively.										
Major	1,237,548	1,101,268	271,076	1,028,268	269,325	1,297,593	12,84,251	32,77,909	5,39,520	51,01,680
Minor	1,329,412	1,259,700	316,550	1,170,158	311,572	1,481,730	13,84,939	33,86,007	5,67,906	53,38,852
Total ..	2,566,960	2,360,968	587,626	2,198,426	580,897	2,779,323	26,69,190	66,63,916	11,07,426	104,40,532
Grand Total ..	5,055,111	4,604,402	877,969	4,372,347	868,603	5,240,950	56,24,002	139,59,814	19,42,994	215,26,810

[S]tatement showing the Irrigable Area, the occupied Area and the Area actually irrigated under, together with the Revenue dependent on, and the actual Revenue derived from, the various Classes of Irrigation Works in the Madras Presidency in Fasli (1292) 1882-83.—(*Continued*).

Works.	Share due to Irrigation.	Deduct Remissions and Deductions.	Net Revenue due to Irrigation.	Financial position of Works on 31st March 1883. Capital Outlay.	Share of Revenue due to Works.	Deduct Working Expenses.	Balance of Revenue.	Deduct Interest Charges.	Balance of Income.	Percentage of Surplus Revenue on Capital Expenditure.
	12	13	14	15	16	17	18	19	20	21
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Class I—Productive Public Works for which Capital and Revenue Accounts are kept.										
1. Godávari Anicut	17,04,639	1,48,238	15,56,401	110,20,241	321,40,280	83,09,475	238,30,805	81,74,910	156,55,895	142·1
2 Kistna do.	9,76,578	1,44,155	8,32,423	63,30,628	149,77,637	46,01,857	103,75,780	48,19,225	55,56,555	87·8
3. Cauvery do.	29,62,848	58,002	29,04,846	11,50,138	138,42,450	— 1,85,934	140,28,384	11,60,217	128,68,167	1118·8
4 Pennér do.	2,38.972	4,015	2,34,957	16,65,159	14,58,121	1,51,356	13,06,765	10,74,532	2,32,233	14·0
5. Srivaikuntham Anicut	1,84,816	13,075	1,71,741	13,12,135	6,11,579	2,64,497	3,47,082	5,92,518	— 2,45,436	..
Total ..	60,67,853	3,67,485	57,00,368	214,78,301	630,30,067	131,41,251	498,88,816	158,21,402	340,67,414	..
Class II—Agricultural Works for which Capital and Revenue Accounts are kept.										
1. Pálár Anicut	2,20,972	3,608	2,17,364	16,80,965	13,23,351	7,41,596	5,81,755	13,71,171	— 7,89,416	..
2. Chembrambaukam Tank	48,296	34	48,262	7,36,589	2,95,835	30,163	2,65,672	2,86,128	— 20,456	..
3. Pelandorai Anicut	9,176	580	8,596	3,87,028	23,767	2,19,635	— 1,95,868	99,205	— 2,95,073	..
4. Madras Water Supply and Irrigation Extension Project ..	21,143	8	21,135	17,09,997	1,16,862	1,27,480	— 10,618	8,40,719	— 8,51,337	..
Total ..	2,99,587	4,230	2,95,357	45,14,579	17,59,815	11,18,874	6,40,941	25,97,223	— 19,56,282	..
Class III—Works for which individually a continuous record is maintained.										
Total ..	17,64,026	75,041	16,88,985	Accounts not kept.						
Class IV—Works for which individually no account is required but which will be accounted for collectively.										
Major	38,17,429	4,21,645	33,95,784							
Minor	39,53,913	6,32,456	33,21,457							
Total ..	77,71,342	10,54,101	67,17,241							
Grand Total ..	159,02,808	15,00,857	144,01,951							

N.B.—This statement does not include Irrigation under the Kurnool Canal which has been only recently taken over by Government, and for which accounts are not yet kept in this Department.

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Order—dated 21st January 1884, No. 100, Revenue.

Irrigation, No. 3.

The Government are obliged to Mr. Wilson for the foregoing valuable resumé of the statistics of irrigation in the Presidency. It brings into strong light the vast importance to the country of the smaller works which form Classes III and IV. The measures to be taken for proper upkeep of these works have recently received much anxious consideration; and, pending a final settlement of the question, it is hoped that the arrangements which have been ordered for the allotment and expenditure of the grants available will work for good. The Board of Revenue will impress upon Collectors the importance of fully utilizing the grants within the financial year.

G.O., dated 23rd July 1883, No. 900.
,, ,, 11th December 1883, No. 1549.

2. A statement giving the results under Classes III and IV by districts would add much to the interest of the report. The figures are of course available, and Mr. Wilson will be requested to have them inserted in the enclosure to his letter before it is printed.

3. Copy will be furnished to the compiler of the Standing Information prefixed to the Administration Report.

4. Copy will also be sent to the Government of India for information.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Director of Revenue Settlement and Agriculture.
,, the Board of Revenue.
,, the Public Works Department, Irrigation Branch.
,, C. D. Macleane, Esq.

No. 100A.

Copy forwarded to the Government of India, Revenue and Agricultural Department.

(Signed) H. E. STOKES,
Secretary to Government.

APPENDIX.

Letter from W. WILSON, Esq., Director of Revenue Settlement and Agriculture, Madras, to the Secretary to Government, Revenue Department, dated 22nd January 1884, No. 6 :—

I have the honor in reference to paragraph 2 of G.O., No. 100, dated 21st current, and in continuation of this office No. 85, dated 3rd December 1883, to submit two statements showing by districts the irrigable area, &c., under Works of Classes III and IV.

Enclosures.

Statement showing the Irrigable Area, Occupied Area, and the Area actually irrigated under, together with the Revenue dependent on, and the Actual Revenue derived from, Class III Works for which Capital and Revenue Accounts are not kept but for which a continuous record is maintained for 1882-83.

Districts.	Irrigable Area.	Occupied Area.		Area Effectively Irrigated.		
		First Crop.	Second Crop.	First Crop.	Second Crop.	Total.
1	2	3	4	5	6	7
	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
Vizagapatam	18,198	17,297	..	17,297	..	17,297
Kurnool	5,425	5,286	3,894	4,952	3,894	8,846
Chingleput	10,600	10,263	1,531	10,228	1,531	11,759
North Arcot	39,856	37,445	4,769	37,444	4,769	42,213
South Arcot	144,846	144,268	13,294	141,929	13,294	155,223
Tanjore	22,987	22,860	1,512	22,860	1,512	24,372
Tinnevelly	53,896	53,437	49,113	53,309	49,113	102,422
Coimbatore	54,561	54,442	30,276	54,174	30,276	84,450
Salem	6,887	491	480	491	480	971
Total ..	357,256	345,789	104,869	342,684	104,869	447,553

Districts.	Revenue dependent on Irrigation Works.				Share due to Irrigation.	Deduct Remissions and Deductions	Net Revenue due to Irrigation.
	Land.	Water.		Total, Land and Water.			
		First Crop.	Second Crop.				
	8	9	10	11	12	13	14
	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Vizagapatam	13,385	42,587	..	55,972	42,587	167	42,420
Kurnool	5,821	25,613	15,358	46,792	40,971	1,403	39,568
Chingleput	9,954	17,848	2,975	30,777	20,823	133	20,690
North Arcot	47,118	1,23,962	12,388	1,83,468	1,36,350	7,790	1,28,560
South Arcot	2,83,095	4,58,215	35,567	7,76,877	4,93,782	62,421	4,31,361
Tanjore	29,804	63,475	3,214	96,483	66,689	..	66,689
Tinnevelly	77,785	3,67,868	2,30,305	6,75,958	5,98,173	665	5,97,508
Coimbatore	59,964	2,98,260	64,472	4,22,696	3,62,732	2,453	3,60,279
Salem	465	1,434	485	2,384	1,919	9	1,910
Total ..	5,27,391	13,99,262	3,64,764	22,91,417	17,64,026	75,041	16,88,985

(Signed) W. WILSON,
Director of Rev. Settl. and Agriculture.

Madras,
22nd January 1884.

STATEMENT showing the Irrigable Area, Occupied Area, and the Area actually irrigated under, together with the Revenue dependent on, and the Actual Revenue derived from, Class IV Works for which no Capital or Revenue Accounts are kept and for which no continuous record is maintained for 1882-83.

Districts.		Irrigable Area.	Occupied Area. First Crop.	Occupied Area. Second Crop.	Area Effectively Irrigated. First Crop.	Area Effectively Irrigated. Second Crop.	Area Effectively Irrigated. Total.	Revenue dependent on Irrigation Works. Land.	Revenue dependent on Irrigation Works. Water. First Crop.	Revenue dependent on Irrigation Works. Water. Second Crop.	Revenue dependent on Irrigation Works. Total, Land and Water.	Share due to Irrigation.	Deduct Remissions and Deductions.	Net Revenue due to Irrigation.
1		2	3	4	5	6	7	8	9	10	11	12	13	14
		ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1. Ganjam	Major	84,464	83,564	74	82,476	74	82,550	1,11,911	1,37,389	103	2,49,403	1,37,492	7,147	1,30,345
	Minor	113,816	116,608	908	112,280	908	113,188	1,39,537	1,50,086	853	2,90,476	1,50,939	15,180	1,35,759
	Total ..	198,280	200,172	982	194,756	982	195,738	2,51,448	2,87,475	956	5,39,879	2,88,431	22,327	2,66,104
2. Vizagapatam	Major	9,313	11,649	..	11,648	..	11,648	8,115	21,888	..	30,003	21,888	197	21,691
	Minor	18,278	18,763	..	18,763	..	18,763	16,275	52,632	..	68,907	52,632	106	52,526
	Total ..	27,591	30,412	..	30,411	..	30,411	24,390	74,520	..	98,910	74,520	303	74,217
3. Godávari	Major	51,892	44,266	895	32,326	895	33,221	54,359	82,188	1,688	1,38,235	83,876	39,075	44,801
	Minor	58,536	47,620	525	31,146	525	31,671	37,601	74,115	802	1,12,518	74,917	43,236	31,681
	Total ..	110,428	91,886	1,420	63,472	1,420	64,892	91,960	1,56,303	2,490	2,50,753	1,58,793	82,311	76,482
4. Kistna	Major	39,727	26,882	35	22,274	35	22,309	32,956	75,565	83	1,08,604	75,648	18,012	57,636
	Minor	21,358	18,368	66	16,231	66	16,297	26,830	58,116	165	85,111	58,281	14,098	44,183
	Total ..	61,085	45,250	101	38,505	101	38,606	59,786	1,33,681	248	1,93,715	1,33,929	32,110	1,01,819
5. Nellore	Major	156,434	133,822	6,379	118,200	6,379	124,579	1,40,334	4,69,281	16,711	6,26,326	4,85,992	75,118	4,10,874
	Minor	38,170	36,957	2,924	33,188	2,924	36,112	37,904	1,15,174	6,665	1,59,743	1,21,839	19,277	1,02,562
	Total ..	194,604	170,779	9,303	151,388	9,303	160,691	1,78,238	5,84,455	23,376	7,86,069	6,07,831	94,395	5,13,436
6. Cuddapah	Major	60,690	55,182	16,484	53,916	16,484	70,400	60,631	2,24,104	47,570	3,32,305	2,71,674	30,333	2,41,341
	Minor	129,801	135,418	35,980	133,893	35,980	169,873	1,19,206	4,88,428	78,219	6,85,853	5,66,647	1,34,886	4,31,761
	Total ..	190,491	190,600	52,464	187,809	52,464	240,273	1,79,837	7,12,532	1,25,789	10,18,158	8,38,321	1,65,219	6,73,102
7. Anantapur	Major	59,256	44,546	10,669	39,106	10,669	49,775	28,118	1,44,677	22,339	1,95,134	1,67,016	27,178	1,39,838
	Minor	65,649	55,233	13,627	50,340	13,627	63,967	29,506	1,60,806	27,452	2,17,764	1,88,258	29,096	1,59,162
	Total ..	124,905	99,779	24,296	89,446	24,296	113,742	57,624	3,05,483	49,791	4,12,898	3,55,274	56,274	2,99,000

Statement showing the Irrigable Area, Occupied Area, and the Area actually irrigated under, together with the Revenue dependent on, and the Actual Revenue derived from Class IV Works, &c.—(*Continued*).

Districts.		Irrigable Area.	Occupied Area.		Area Effectively Irrigated.			Revenue dependent on Irrigation Works.				Share due to Irrigation.	Deduct Remissions and Deductions.	Net Revenue due to Irrigation.
			First Crop.	Second Crop.	First Crop.	Second Crop.	Total.	Land.	Water. First Crop.	Water. Second Crop.	Total, Land and Water.			
1		2	3	4	5	6	7	8	9	10	11	12	13	14
		ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
8. Bellary	Major	34,776	29,812	11,119	28,963	11,119	40,082	16,237	1,40,694	28,588	1,85,519	1,69,282	8,696	1,60,586
	Minor	30,155	25,812	7,482	24,347	7,482	31,829	12,416	70,697	9,001	92,114	79,698	9,473	70,225
	Total ..	64,931	55,624	18,601	53,310	18,601	71,911	28,653	2,11,391	37,589	2,77,633	2,48,980	18,169	2,30,811
9. Kurnool	Major	16,029	15,604	2,776	14,980	2,776	17,756	16,619	56,034	6,514	79,167	62,548	5,237	57,311
	Minor	26,518	25,543	4,048	23,875	4,048	27,923	25,866	81,978	10,186	1,18,030	92,164	13,332	78,832
	Total ..	42,547	41,147	6,824	38,855	6,824	45,679	42,485	1,38,012	16,700	1,97,197	1,54,712	18,569	1,36,143
10. Chingleput	Major	190,491	189,900	34,145	188,433	34,145	222,578	2,29,416	4,32,613	68,754	7,30,783	5,01,367	12,069	4,89,298
	Minor	132,624	127,638	17,867	126,933	17,867	144,800	1,30,296	2,46,781	32,279	4,09,356	2,79,060	3,742	2,75,318
	Total ..	323,115	317,538	52,012	315,366	52,012	367,378	3,59,712	6,79,394	1,01,033	11,40,139	7,80,427	15,811	7,64,616
11. North Arcot	Major	63,759	60,249	18,075	59,034	18,075	77,109	75,277	1,82,725	42,875	3,00,877	2,25,600	14,786	2,10,814
	Minor	145,366	142,792	54,162	141,611	54,162	195,773	1,71,023	4,25,066	1,19,829	7,15,918	5,44,895	43,125	5,01,770
	Total ..	209,125	203,041	72,237	200,645	72,237	272,882	2,46,300	6,07,791	1,62,704	10,16,795	7,70,495	57,911	7,12,584
12. South Arcot	Major	126,527	78,294	7,724	72,068	7,724	79,792	1,32,050	2,67,036	22,345	4,21,431	2,89,381	58,056	2,31,325
	Minor	162,820	157,953	16,986	141,045	16,986	158,031	2,50,625	5,11,413	47,377	8,09,415	5,58,790	1,36,328	4,22,462
	Total ..	289,347	236,247	24,710	213,113	24,710	237,823	3,82,675	7,78,449	69,722	12,30,846	8,48,171	1,94,384	6,53,787
13. Tanjore	Major	19,528	17,283	1,091	17,283	1,091	18,374	15,384	30,348	2,176	47,908	32,524	..	32,524
	Minor	31,231	28,973	1,829	28,973	1,829	30,802	28,660	50,815	3,218	82,693	54,033	..	54,033
	Total ..	50,759	46,256	2,920	46,256	2,920	49,176	44,044	81,163	5,394	1,30,601	86,557	..	86,557
14. Trichinopoly	Major	69,492	68,979	26,107	67,572	26,107	93,679	83,386	1,94,318	47,098	3,24,802	2,41,416	15,696	2,25,720
	Minor	61,759	64,322	20,332	64,049	20,332	84,381	62,510	1,41,609	36,791	2,40,910	1,78,400	9,770	1,68,630
	Total ..	131,251	133,301	46,439	131,621	46,439	178,060	1,45,896	3,35,927	83,889	5,65,712	4,19,816	25,466	3,94,350

Statement showing the Irrigable Area, Occupied Area, and the Area actually irrigated under, together with the Revenue dependent on, and the Actual Revenue derived from, Class IV Works, &c.—(*Continued*).

Districts.		Irrigable Area.	Occupied Area. First Crop.	Occupied Area. Second Crop.	Area Effectively Irrigated. First Crop.	Area Effectively Irrigated. Second Crop.	Area Effectively Irrigated. Total.	Revenue dependent on Irrigation Works. Land.	Revenue dependent on Irrigation Works. Water. First Crop.	Revenue dependent on Irrigation Works. Water. Second Crop.	Revenue dependent on Irrigation Works. Total, Land and Water.	Share due to Irrigation.	Deduct Remissions and Deductions.	Net Revenue due to Irrigation.
1		2	3	4	5	6	7	8	9	10	11	12	13	14
		ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	RS	RS.	RS.	RS.	RS.	RS.	RS.
15. Madura	Major	112,928	103,171	48,530	89,298	48,530	137,828	1,25,104	2,37,137	76,600	4,38,841	3,13,737	67,936	2,45,801
	Minor	92,789	84,497	26,399	68,547	26,399	94,946	1,03,691	1,73,033	38,607	3,15,331	2,11,640	82,225	1,29,415
	Total ..	205,717	187,668	74,929	157,845	74,929	232,774	2,28,795	4,10,170	1,15,207	7,54,172	5,25,377	1,50,161	3,75,216
16. Tinnevelly	Major	81,379	81,534	55,664	76,059	55,664	131,723	82,612	3,56,208	1,07,174	5,45,994	4,63,382	28,911	4,34,471
	Minor	90,280	80,764	37,134	68,881	37,134	106,015	72,434	3,27,703	87,989	4,88,126	4,15,692	44,888	3,70,804
	Total ..	171,659	162,298	92,798	144,940	92,798	237,738	155,046	6,83,911	1,95,163	10,34,120	8,79,074	73,799	8,05,275
17. Coimbatore	Major	34,575	33,345	10,106	33,197	10,106	43,303	29,806	1,43,664	18,066	1,91,536	1,61,730	3,162	1,58,568
	Minor	13,421	12,813	4,015	10,810	3,377	14,187	10,466	44,823	6,982	62,271	51,805	10,304	41,501
	Total ..	47,996	46,158	14,121	44,007	13,483	57,490	40,272	1,88,487	25,048	2,53,807	2,13,535	13,466	2,00,069
18. Salem	Major	26,288	23,186	21,203	21,435	19,452	40,887	41,936	82,040	30,836	1,54,812	1,12,876	10,036	1,02,840
	Minor	96,841	79,626	72,266	75,246	67,926	143,172	110,093	2,12,732	61,491	3,84,316	2,74,223	23,390	2,50,833
	Total ..	123,129	102,812	93,469	96,681	87,378	184,059	152,029	2,94,772	92,327	5,39,128	3,87,099	33,426	3,53,673
Total	Major	1,237,548	1,101,268	271,076	1,028,268	269,325	1,297,593	12,84,251	32,77,909	5,39,520	51,01,680	38,17,429	4,21,645	33,95,784
	Minor	1,329,412	1,259,700	316,550	1,170,158	311,572	1,481,730	13,84,939	33,86,007	5,67,906	53,38,852	39,53,913	6,32,456	33,21,457
	Total ..	2,566,960	2,360,968	587,626	2,198,426	580,897	2,779,323	26,69,190	66,63,916	11,07,426	104,40,532	77,71,342	10,54,101	67,17,241

Madras,
22nd January 1884.

(Signed) W. WILSON,
Director of Rev. Settl. and Agriculture.

Exd. W. H. French.

150 Copies.

997

In No 502/84

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 21st January 1884, Nos. 100, 100A.

JANUARY.

Irrigation Statistics.

Recording the acknowledgments of Government for the valuable resumé of — placed before them by the Director of Revenue Settlement and Agriculture, and observing that it brings into strong light the vast importance to the country of the smaller works which form the last two classes.

No 580

Communicated to the officers in charge of Settlement Parties and to the Agricultural Reporter to Government.

Sheagarah
1st Assistant
for Director of Reve: Sett & Agri.

Dept of Reve: Settl.
& Agriculture
Madras 22 February 1884

To
The Dy. Director of Reve:
Settl. No III Party

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Comp. Seemaya

23RD JANUARY 1884, No. 120, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from H. M. KISCH, Esq., C.S., Officiating Under-Secretary to the Government of India, Revenue and Agricultural Department (Revenue), to the Secretary to the Government of Madras, dated Calcutta, 9th January 1884, Circular No. 4 R.

Despatch to the Secretary of State, No. 17, dated 17th October 1882.
Despatch from the Secretary of State, No. 24, dated 22nd March 1883.

In continuation of the letter from this office, No. 536, dated the 15th May 1883, I am directed to forward for information a copy of the despatches quoted in the margin regarding the principles which should regulate revisions of periodical settlements of the land revenue in Upper India.

ENCLOSURES.

Letter from the Government of India, Revenue and Agricultural Department (Revenue), to the Right Honorable the MARQUIS OF HARTINGTON, Her Majesty's Secretary of State for India, dated Simla, 17th October 1882, No. 17 :—

Reform in land revenue settlement has been long under consideration. Lord Northbrook's advocacy of self-regulating system.

The question of reform in the system of land revenue settlements in Upper India, which had occupied the attention of Her Majesty's Government in England and of the revenue authorities in this country for a period of fifteen years, came in 1876 under the consideration of Lord Northbrook, who advised the adoption of some self-acting system of regulating the land revenue by reference to general prices from time to time, after fixed terms of years, as affording the only safe manner of introducing a more permanent system of settlement. The papers were subsequently referred by His Lordship to the Honorable Member in charge of the Department of Revenue, Agriculture and Commerce, but after three years were in 1879 deposited without orders.

Preliminary measures indicated in despatch of 10th October 1881.

2. In the past year the question of reform in the land revenue system has been revived from an independent direction. It became our duty to submit to your Lordship, with our despatch, No. 14, dated the 10th October 1881, a memorandum on current land settlements, in which a sketch of the temporary land revenue settlements actually current in British India was contained. In the resolution which we issued with this memorandum we conceived it necessary to instruct local Governments to enter upon no new settlement without a careful examination of the circumstances of the district or tract of which it might be proposed to revise the assessments, and we took the precaution of reserving to ourselves the power of placing a veto upon the revision of assessment in any case in which we may deem the renewal of settlement operations to be undesirable. In taking this step we were aware that we should have shortly to confirm it by more positive action.

Objections to temporary settlements.

3. We do not conceive it necessary to repeat at any length the facts which have from time to time been brought forward in illustration of the evil effects of renewing settlement operations at comparatively short intervals. The uneasiness arising from uncertainty; the harassment of the agricultural classes; the discontent engendered by mistaken assessments; the check to expenditure on improvements; the positive deterioration of agriculture in the last years of the term of settlement—are only the most prominent among them. The arguments on this subject are familiar to Her Majesty's Government. But although we think it unnecessary to revert to any general discussion on the relative advantages of a permanent and a temporary system of settlement, we deem it advisable before entering upon any suggestions for further action to place before your Lordship a brief explanation of the position to which the discussions

and administrative procedure since 1822 have led the question of land revenue assessment in Upper India. A review of this position and of the history of the settlements made since that date will, we believe, satisfy your Lordship of the necessity of entering upon a decisive policy.

Historical sketch of settlement systems in Upper India.

4. The first occasion on which an attempt was made to gain a complete mastery over the complicated conditions of the agricultural system of Upper India was in connection with Regulation VII of 1822. The main objects of the regulation were two. The first a complete record of tenures and occupancy rights; the second a complete valuation of agricultural land.

Regulation VII of 1822 prescribed an estimate of the produce of each field.

An elaborate scheme was drawn up for the minute investigation of every cultivator's holding in every village in the Upper Provinces. The Governor-General in Council announced that the perpetual settlement of Bengal having "as far as concerns the ryots, essentially failed to produce the contemplated benefit, is strongly inclined to the opinion that no real security can be given to the ryots unless the Government distinctly acts upon the principle of minutely ascertaining and recording the rents payable by individual ryots, of granting pottahs, or, at least, registering the ryots' holdings, and of maintaining the rates established at the settlement during the term of settlement as an essential part of the assessment." But the scheme, admirable as it was in conception, and just in aim, failed in practice because weighted by one impossible condition. The condition was that the produce of every field should be ascertained. "It seems necessary," wrote His Excellency in Council, "to enter upon the task of fixing in detail the rates of rent and modes of payment current in each mauzah and applicable to each field, and anything short of this must be regarded as a very imperfect settlement." It was laid down that the rate on each field was to be calculated from an estimate of its produce. This process was far too ambitious in detail and cumbrous in operation. The letters and reports of the assessing officers who attempted to carry out the injunctions of the Government of India teem with complaints of the difficulty of a task which the late Lord Mayo declared in 1871 to be well nigh impossible.

Failure of Regulation VII.

5. It is not therefore surprising to find that the magnificent undertaking of 1822 failed in accomplishment, and that during a vain and protracted struggle on the part of the settlement officers to perform the task allotted to them, the attention of the Government of India was continually attracted to the slow progress that was being made. At last the Governor-General called for a report as to the progress of settlement operations. The Upper Board, though eight years had passed, "could record little or no progress, and could venture no certain information." They strongly contended that an attempt to calculate the demand upon an estimate of the produce of each cultivator's holding was an impossible undertaking.

Mr. Bird proposes to substitute prevailing money rates.

6. In the 9th year the Board of Revenue submitted a series of notes to the Governor-General, in which it was strongly urged by Mr. Bird, one of the members, that the prevailing money rates paid by cultivators should be made the basis of assessments; that they should be fixed with a tendency to moderation for the term of settlement; and that the aggregate sum "composed of the items which each ryot is bound to pay" having been ascertained, the demand should be distributed over the various proprietary holdings. He demurred to any continuance of the attempt to ascertain what proportion of the crop would be a fair rent for each field.

Lord William Bentinck reviews Mr. Bird's proposals and substitutes "general considerations."

On the receipt of the Board's earlier notes, Lord William Bentinck in an exhaustive minute, dated the 26th September 1832, reviewed the whole history of settlement operations in the North-Western Provinces. His Lordship disapproved of Mr. Bird's proposals to fix the rents of all cultivators for the term of settlement on the ground that they had not all the same rights, and showed how an aggregate demand might be calculated on general considerations. "The assessment," he wrote, "may be fixed on an ascertainment in the aggregate of the cultivated area of each estate and a general acquaintance with the advantages possessed by each village as regards fertility, position, population, and any other matters which require to be taken into consideration when regulating the Government demand." In another portion of his minute His Lordship observed that "a relinquishment by Government of 30 or 35 per cent. of the estimated gross rent would seem to be sufficient under the most unfavorable circumstances to serve as a remunerating return and to cover all expenses and risk of collection. By the term 'gross rent,'" His Lordship adds, "I mean the proportion of the produce or the value of the produce remaining after defraying the wages of labor and profits of stock."

Conference at Allahabad in 1833.

7. The minute concluded by giving instructions for a series of inquiries, "having for their object the ascertainment and recognition of tenures of all kinds, and the speedy and equitable assessment of the land revenue for extended terms under some more summary system than that adopted by Regulation VII of 1822."* These injunctions resulted in the autumn of 1833

* Preface to Government Selections, 1822 to 1833, North-Western Provinces.

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in a conference of revenue officials at Allahabad under the presidency of the Governor-General, the object of which was "to ascertain the best means of simplifying and expediting the existing process of survey and settlement." *

Regulation IX of 1833, based on Lord William Bentinck's proposals.

8. The conference met under the presidency of the Governor-General in person, and resulted in the enactment of Regulation IX of 1833, which remained in force until its provisions, so far as they regard the assessment of revenue in the North-Western Provinces, were repealed, though not materially altered, by Act XIX, 1873 (the North-Western Provinces Land Revenue Act). The system of assessment introduced by Regulation IX of 1833 differed chiefly from that laid down or supposed to have been laid down by Regulation VII, 1822, in this that it dispensed with a minute investigation and ascertainment of the produce of the soil, and permitted the assessing officer to determine the revenue payable by each village on the basis of those general considerations indicated by Lord William Bentinck in the minute above quoted. Under Regulation IX of 1833 the settlements of all districts in the North-Western Provinces were effected. The work was conducted by officers of undoubted ability and experience, much labor was bestowed upon it, and an accuracy was attained far greater than had been reached in previous assessments. The inequality of assessment which had characterised many of the earlier settlements was to some extent removed and the record of rights was perhaps for the first time brought into order. As a whole, the settlement was an undoubted benefit to the country, which before had been harassed by constantly recurring, and in most cases increasing, assessments of revenue. These benefits, however, were not universally secured : instances of over-assessment were not unknown ; while it seldom occurred that in making a forecast of the profits of an estate sufficient attention was paid to the liability of the harvests to occasional failure. Few, indeed, of the settlements worked easily until, towards the end of the first decade, the increase in the area under cultivation and the rise in the prices of produce added greatly to the resources of the agricultural classes.

Period of settlements and reduction of Government share of rental to one-half from two-thirds.

9. The settlement of Regulation IX, 1833, was made on the principle of taking for the Government two-thirds of the net assets or of the rental of the land. This was no doubt a most generous settlement as compared with the terms prevailing under Native Governments. But it must always be remembered that the native system of collection is far less stringent and more elastic than ours. It affords more opportunities of evasion, and pays more consideration to bad seasons and deficiencies in the harvest. The occasional failure of the new settlements, together with the recollection of the mischief wrought by over-assessment in the years subsequent to the cession and conquest of the provinces, led the Government of the North-West, when the period of the settlements under Regulation IX was drawing to a close, to reconsider the conditions which should be imposed on the proprietors of land. At that time (about 1854) apparently men's thoughts had been completely turned away from the consideration of a permanent settlement. In 1802-3 a pledge had been given by the local authorities to the people of the provinces that the settlement should be made in perpetuity. The pledge was given subject to the sanction of the Honorable Court of Directors, and the sanction was withheld. It must be looked upon as a matter of congratulation that the Court took this view. For, looking to the complicated tenures in the North-Western Provinces, and the ignorance on the subject which prevailed among our officers at that early time of the British rule, it is certain that much injustice and evil would have resulted from a perpetual settlement on the Bengal model, to say nothing of the loss of revenue that must have ensued. After that time, as the faults of the Bengal settlement became more and more apparent, the idea of making a permanent settlement ceased to be entertained. Under Regulation VII of 1822, the term which the Government of India was generally disposed to accept is stated in the resolution issued with the regulation to be from ten to twelve years, though a longer period was in some cases to be admitted. Lord William Bentinck, in his minute of the 26th September 1832, advised the extension of the term to fifteen or twenty years. The advantages of a long period were at length so far acknowledged that most of the settlements effected under Regulation IX of 1833 were made for thirty years. Revenue officers accepted as established the system of a temporary assessment for a long term, and thought only of perfecting it. Hence it was that when Mr. Thomason, Lieutenant-Governor of the North-Western Provinces, considered the best mode of avoiding the faults of former years, he thought not of a permanent settlement or of a settlement for a longer term than thirty years, but of a more lenient settlement. He determined accordingly to reduce the share of the rental or net assets taken by Government to one-half, and all the assessments made within the last five-and-twenty years in the North-Western Provinces, Oudh, and Central Provinces have been calculated on that scale.

The idea of a permanent settlement set aside.

Moderate assessment for long terms adopted.

* Preface to Government Selections, 1822 to 1833, North-Western Provinces.

10. The question of a permanent settlement was thus for the time set at rest, and perfection was thought to have been attained in a moderate settlement for a long period. The next stage in the history dates from the famine of 1861, which drew earnest attention to the state of the agricultural classes in Northern India. Colonel Baird Smith, who was sent to report on the famine, was struck by the great resistance offered to the calamity by the people in 1861, as compared with that offered in 1837-38. Arguing that the improvement in the wealth of the peasantry and their ability to bear up against misfortune was due to the long term of the settlement, he inferred that a further application of the same principle would achieve greater success. He became a strong advocate of a permanent settlement, and the discussions which arose from his report led to the issue of Sir Charles Wood's despatch of 1862, in which Her Majesty's Government announced its resolve "to sanction a permanent settlement of the land revenue throughout India."

Question of a permanent settlement revived by Colonel Baird Smith in 1861.

11. The despatch dwelt on the political and social advantages attendant on such a measure and on the stimulus it would give to agriculture and to the growth of a middle class connected with the land. The recommendations of Colonel Baird Smith and of Sir Thomas Monro, and the example of the lightly-assessed district of Tanjore, were cited. Coming to the question of a future fall in the value of money, the despatch considered that it was not of sufficient moment to influence the judgment of Her Majesty's Government to any material extent. Prices, it was said, were unlikely to rise greatly; even if they should rise, the Government of India might easily find sources of income other than the land. The alternative to a permanent settlement was pronounced to be a long protracted and elaborate revision of assessments every thirty years, and the "harassing, vexatious and even oppressive" nature of such revisions was forcibly dwelt on. "The remedy for these evils, the needless occupation of the valuable time of the public officers employed in the revision, the extortion of the subordinate officers, and the loss of wealth to the community from the deterioration of cultivation, lies in a permanent settlement of the land revenue." The principle thus settled, the Government of India was invited to consider to what extent it could be immediately applied throughout the different provinces. Of Bombay and Madras, it was said that the settlement of the former presidency required revision before it could be made permanent, while the settlement of the latter was not as yet completed. To these presidencies, therefore a permanent settlement could not be immediately given. The North-Western Provinces, where revision of the settlements was in progress, were finally selected as the fittest place in which the measure could be carried out.

Sir C. Wood's despatch of 1862.

Orders permanent settlement in North-Western Provinces.

12. The despatch was communicated to the North-West Government by the Government of India, and was followed by a discussion as to the best way of giving effect in that province to the wishes of the Secretary of State. The Honorable Mr. E. Drummond, Lieutenant-Governor of the North-Western Provinces, Messrs. Muir and Money, Members of the North-Western Provinces Board of Revenue, Sir C. Trevelyan, and Mr. H. B. Harington, Members of Council, took a prominent part in this discussion. The conclusion seems to have been accepted that the orders of Her Majesty's Government must be carried into effect. Two pleas, however, against the introduction of a permanent settlement into many parts of the province found strong expression: the first, that the agriculture of many tracts was in a backward condition; the second, that the scale of rent-rates in other more fully developed tracts was comparatively low.

Orders accepted but objections pleaded.

13. Lord Lawrence summed up his own conclusions in a lengthy minute, in which he recommended that the permanent settlement should only be conceded to estates of which the rentals, as well as the agriculture, were fully developed. The test of the latter condition was that 80 per cent. of the cultivable area should be under cultivation. The former condition was left to the judgment of the revenue authorities. Estates which did not fulfil these conditions were to be assessed on the basis of their present assets for 30 years. A compromise was, however, to be permitted in the case of undeveloped estates by the offer to their proprietors of a permanent assessment based on prospective assets. A maximum permanent demand was to be fixed which it would be in the option of the proprietors at any time to accept in lieu of the temporary assessment. Lord Lawrence, in permitting this offer to be made, had little hope that advantage would be taken of it, nor did the proposal meet with favor from his advisers.

Lord Lawrence proposes to attach conditions.

14. Sir Charles Wood, after a consideration of the proceedings of 1864, communicated to the Government of India in his despatch of the 24th March 1865 revised instructions under which districts were to be divided into three classes:—

Sir C Wood's despatch of 1864 accepts conditions with modifications.

(1) Those in which the agricultural population and rent were undeveloped.
(2) Those in which cultivation and resources were fully developed.
(3) Those in which resources were undeveloped.

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With regard to the first two classes, he remarked that no difficulty existed. Permanency of settlement was to be refused to the first and granted to the second. He admitted that there might be difficulty in the case of the third class; but he negatived the proposal to allow any offers to be made which might be based upon a calculation of the future assets of an estate. He limited the offer of a permanent settlement to those villages in which the cultivation might amount to 80 per cent. of the cultivable area, but did not require that the rule limiting the demand to 50 per cent. of the existing assets should be strictly adhered to. No definition of "resources" was given. And no distinct instructions were contained in the despatch as to the course to be taken in the case of estates in which 80 per cent. of the cultivable land had been brought under cultivation, but in which the resources were undeveloped.

Reaction against permanent settlement.

15. Meanwhile, a growing reaction of official opinion, to which further reference will presently be made, against the sacrifice of prospective land revenue, especially of that resulting from extension of canal irrigation, led to a reopening of the question by Earl de Grey and Sir Stafford Northcote.

Further limitations imposed by Sir S. Northcote and Earl de Grey.

Sir Stafford Northcote in his despatch of the 23rd March 1867 laid down two conditions for permanent settlement, the second of which had originally been laid down by Earl de Grey:—

First, that no estate shall be permanently settled in which the actual cultivation amounts to less than 80 per cent. of the cultivable or malguzari area.

Secondly, that no permanent settlement shall be concluded for any estate to which canal irrigation is likely to be extended within the next twenty years, and the existing assets of which will thereby be increased in the proportion of 20 per cent.

Despatch of 26th May 1871, Government of India advises abandonment of permanent settlement.

16. We will not endeavour to follow the history of the efforts which were made in obedience to the successive instructions of Sir Charles Wood and Sir Stafford Northcote for the introduction of a permanent settlement. A full record of the steps that were taken and of the discussions which ensued finds place in the volume of papers submitted to Her Majesty's Secretary of State with the despatch from the Government of India, No. 7, dated 26th May 1871. The papers include minutes by Sir John Strachey and Lord Mayo pointing to the advantages of a grain assessment over a fixed money settlement. Lord Mayo gave an important indication of the manner in which it might be possible to avoid the recurrence of temporary settlements in the following words:—"In India at original settlement it will always be necessary to consider more fully than in Europe the quality of soil and the quantity of produce which, under fair cultivation, is ordinarily produced; but once this is established, the fluctuation of market price may form the main test for determining value from time to time."

17. His Grace the Duke of Argyll was finally advised that the conditions laid down regarding permanent settlements in the North-Western Provinces could not be applied in their existing form without leading to the most serious and certain injury to the future interests of the public.

We shall in succeeding paragraphs of this despatch be constrained to examine the causes which led to so decisive a rejection of a permanent settlement as that which is embodied in the despatch of the 26th of May, but we desire, first, to describe to your Lordship what has occurred between 1871 and the present date.

Home Government suspends decision pending receipt of further evidence.

18. Your Lordship is aware that in the despatch, No. 26, dated 27th July 1871, Her Majesty's Secretary of State communicated the conclusion arrived at by a Select Committee of the House of Commons, that further proceedings for extending the permanent settlement in the North-Western Provinces must for the time be suspended, but that Her Majesty's Government should be placed in a position to form a judgment upon so important a subject so soon as the Government of India had fully weighed the additional evidence which was to be furnished by the Lieutenant-Governor, North-Western Provinces. The instructions of Her Majesty's Government were communicated to the Governments of the North-Western Provinces, Punjab and Oudh, with a request

Local Governments consulted.

To North-Western Provinces, Punjab and Oudh, Nos. 283 to 285, dated 13th September 1871, pages 323-324 of the Revenue, Agriculture and Commerce Department, Land Revenue and Settlement Proceedings for September 1871.

for an early expression of opinion, and replies * were received by the Government of India bearing dates noted in the margin. The North-Western Provinces letter contained a new suggestion by Sir William Muir for the revision of settlements by a ratable increase on the existing demand after fixed periods. The Chief Commissioner of Oudh advocated the retention of the present system of temporary assessments, while the Lieutenant-Governor of the Punjab represented that his province was not ripe for a permanent settlement. The papers were placed before His Excellency Lord Northbrook, who referred them for the opinion of Sir John Strachey, then Lieutenant-Governor of the North-Western Provinces, and of the Honorable Mr. J. Inglis, then Officiating Member of Council.† Sir John Strachey deprecated any steps which would fetter the future finances of the country by fixing for ever the amount which the land should contribute to the State, and found reason to doubt whether even the grain assessment which he had formerly suggested would be entirely successful. Mr. Inglis, on the other hand, who had from the first advocated a permanent settlement, brought forward a mass of evidence from the native papers in proof of the unpopularity of the existing system, and urged the political advantages that would attend the introduction of permanency.

* From North-Western Provinces Government, No. 658 A, dated 2nd March 1874, page 5, of Home, Revenue and Agriculture Department, Revenue Proceedings for July 1879.
From Chief Commissioner, Oudh, No. 1358, dated 24th April 1872, page 99, of Revenue, Agriculture and Commerce Department, Land Revenue and Settlement Proceedings for February 1873.
From Government, Punjab, No. 1470, dated 8th October 1873, copy enclosed.

† From North-Western Provinces Government, No. 2372 A., dated 6th October 1874, page 30, of Home, Revenue and Agriculture Department, Revenue Proceedings for July 1879.

Lord Northbrook proposes a self-regulating system.

19. When the papers again came before Lord Northbrook in 1876, they were brought forward in the Finance Department. Sir William Muir was now Finance Minister, and was considering at the time the difficult question of the depreciation of silver which was then causing considerable embarrassment to the Government of India. The financial position, however, afforded satisfactory proof of the danger of attaching permanency to a fixed money assessment. After some discussion the papers were, as has been said before, referred to Sir Alexander Arbuthnot, the Honorable Member in charge the Department of Revenue, Agriculture and Commerce, and when they were finally returned by him in 1879, it seems to have been considered inexpedient, on the grounds that no local Government desired a permanent settlement, to take any further measures. The papers were accordingly deposited without orders. His Excellency in Council, however, now considers that the time has come when the important question of settlement reform must be earnestly revived.

In 1879 the papers are deposited without orders.

Necessity of reviving question of settlement reform.
Causes of failure of previous attempts.

20. Before submitting definite proposals for the consideration of Her Majesty's Government, it is necessary to examine more precisely the causes which have led to the failure of previous attempts and projects to place the land revenue assessments of Northern India upon a satisfactory footing. The difficulties which have stood in the way of a solution of the most serious problem with which we have had to deal since the beginning of the century must be thoroughly appreciated and removed before any further step is taken towards reform.

Impossibility of accurately valuing land,

21. The foremost of these difficulties is the valuation of land. It appears to be sufficiently evident that the efforts made from 1822 up to the present time to make a satisfactory estimate of the value of agricultural land have been far from uniformly successful. In analysing the history of these attempts, the minute by Lord Mayo, to which we have alluded in our 16th paragraph, will afford much assistance. His Lordship, whom a familiarity with land questions in Ireland rendered peculiarly able to deal with the subject, explained that there are four principal modes by which the value of land is usually ascertained—*1st*, the quantity of produce; *2nd*, the price of produce; *3rd*, the quality of soil; *4th*, the letting value. On none of these, in Lord Mayo's opinion, could certain reliance be placed. "The objection," he said, "to testing value by quantity only is—*first*, that it is most difficult and nearly impossible to ascertain; and *secondly*, that it depends to a great extent upon the varying industry of the cultivator and the chances of the season." The history of the struggles made between 1822 and 1833 to estimate the quantity of produce is a sufficient illustration of the truth of His Lordship's opinion. We have already had to relate how the impossibility of the task drove the authorities of 1833 to look for other methods.

whether based on an estimate of produce,

or on examination of the capabilities of soils,

22. The authors of Regulation IX of 1833 abandoned the attempt to ascertain the produce. They did not, however, condemn the principle of basing the assessment on a valuation of land. "There can," wrote Lord William Bentinck of the system introduced by Regulation

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VII of 1822 (paragraph 72, minute of 7th April 1831), "be but one opinion as to the soundness of its theory; its practical application is all that can be doubted." He complained that various and contradictory methods were practised by settlement officers for ascertaining the value of land, and sought to introduce uniform principles, of which the most important in his view was the ascertainment of the capabilities of each class of soil. "Assessment according to the capabilities of the soil," we find His Lordship writing in the 119th paragraph, "would appear to be the simpler and more equitable method, if regard be had to fixing rates according to position as well as according to fertility." The practical development of the system of inquiry pursued under Regulation IX of 1833 is illustrated by the instructions contained in Mr. Thomason's Directions to Settlement Officers, published some sixteen years after the issue of the regulation. Two-thirds of the net produce was to be taken as the Government share. "Net produce is defined to be the surplus which the estate must yield after deducting the expenses of cultivation, including the profits of stock and wages of labor: this in an estate held by cultivating proprietors will be the profit on seer, but in leased estates will be the gross rental." In order to come to a correct opinion on this subject, the settlement officer is referred to the areas of cultivation and irrigation and to an examination of different kinds of soils. Other general considerations were to influence his judgment, but the above are the principal guides which he is to follow. These instructions were repeated in the authoritative orders issued in 1855 known as the Saharanpore Rules, by which for the next twenty years settlement officers in the North-Western Provinces were guided.

or on the letting value of land.

23. The existing rules which were framed in 1873 give still more precise instructions to settlement officers to divide any tract which is to be assessed into circles or areas of similar soils possessing similar advantages, and to ascertain the prevailing rent-rates paid upon each class of soil in the locality. In the latter words we have the first clear instructions for the adoption of the method of assessing land by its letting value. Lord Mayo himself placed considerable reliance on this method. "The letting price of land," wrote His Lordship, "is the best and surest test of value where there is full competition." But His Lordship feared that the test would not be found a satisfactory one in this country, and quoted both Sir William Muir and Sir John Strachey in support of this opinion. "It is clear," he decided after referring to their evidence, "that the letting value of land or the rent paid can form in India no safe test of its value." In other words, the letting value of land on which settlement officers had been instructed to base their assessments was not admitted by Lord Mayo and his advisers to be the true value of the land.

Lord Mayo's suggestion to ascertain the quantity of produce reaching the market.

24. His Lordship's conclusion was that the most simple method to adopt might perhaps be to ascertain how much produce from an estate found its way to the trader's hands, and to regulate future settlements by the changes which might occur in the selling price of this amount. "If this is impossible," concluded His Lordship, "if the objections which can be urged against this system are found to be too weighty, then no other course is left to us but to continue that system of periodical settlement which prevails in the greater part of India."

Difficulty of valuing land influenced rejection of permanent settlement.

25. There are two points to which we desire to draw your Lordship's attention in the above paragraphs — one is the difficulty of making a thoroughly correct valuation of land in Northern India by any available method; the second is the impossibility of attaching to all land, for purposes of its assessment the full value which it may be expected ultimately to attain.

It appears important to give some prominence to these conclusions because we cannot but perceive that the rejection of the permanent settlement in the North-Western Provinces, at the period of which we have been writing, was mainly due to the feeling of the provincial authorities that the value of land, as then estimated, was not always its true value. Some feared that the benefit arising from the limitation of the Government demand based upon an imperfect valuation of the land would remain entirely with the landlords and would not reach the tenants. Their sense of justice was offended. Others avowed their regret that Government should lose any portion of the full share to which it would be entitled when the full value of land had been reached. On both grounds were the proposals for a permanent settlement viewed with disfavor. The comprehension of this position possesses in our judgment so much importance as to deserve further illustration.

Other objections to permanent settlement.

26. Although the feeling, that the cultivators would not share in the benefits which were to be offered to the landlords, seems to have had considerable influence in leading settlement officers to oppose the introduction of a permanent assessment, we are not for the moment concerned with this part of the question. We desire to show that the revenue authorities grudged the loss to Government of its share in the enhancement of the rental which, apart

from any increase in the cultivated or irrigated areas, the landlords could, under existing laws, exact from the tenantry. The feeling is strongly reflected in the following passages in Sir W. Muir's minutes written during the progress of the inquiries which were intended to lead to the partial introduction of a permanent settlement:—

Loss of Government share in increased rental.

"The lesson may also fairly be learned from the history of this settlement (Bulandshahr) that the two conditions enjoined by Her Majesty's Government for a permanent settlement are not sufficient. I do not here advert to the policy itself of making settlements in perpetuity; that policy has been definitely adopted by Her Majesty's Government, and announced, if not promised, to the people; I should not, even had I not myself concurred in the policy, have felt at liberty to question it on the present occasion. It is evident, however, that the sacrifice to which Government in conceding a permanent settlement has consented is one of future revenue from improvements accelerated by the increased investment of capital by proprietors when secure of the whole result. But in the case of a settlement like the present, based on an imperfectly developed rental, the sacrifice would be of future revenue created by no such expenditure, but simply by the exertion of proprietary power in increasing the relative share of the produce which constitutes rent. This is a process which, in the nature of things, will come to pass equally whether the settlement be in perpetuity or for a term, and the sacrifice would be consequently gratuitous made without any corresponding object or return.

Urged by Sir William Muir.

"I think, therefore, that a third condition for permanent settlement is thus shown to be quite necessary, namely, evidence that the standard of rent prevalent, or the estimate of 'net produce' on which the assessments are based, is adequate; or (having due regard to soil, facilities of irrigation, and ratio of dry and wet land) is not below the level of rent throughout the country at large." (*Minute dated 22nd December* 1869.)

And again, writing of pargana Baghput, he says:—

"The present case is represented as being one of inadequacy in the rent, not of individual villages compared with the pargana, but in the prevailing rates of the pargana itself compared with other parganas. It is also a case in which all the conditions prescribed by Her Majesty's Government as entitling proprietors to a permanent settlement exist: cultivation in Baghput is highly developed; canal irrigation has reached its full limit. But the cultivator appears here to retain a larger share of the profits than elsewhere." (*Minute dated 13th February* 1869.)

Existing inequality of the Government demand.

27. While the arguments used in the above passages indicate an unwillingness to resign to the landlords the whole increase of rent which they were certain to obtain from their tenants, they point also to another cause which seems to have influenced the revenue authorities in their rejection of a permanent settlement and which deserves serious consideration. We refer to a desire to effect an equalisation of the Government demand. The theory that the share of Government must be made to approach as nearly as possible to the same fraction of the net produce in all parts of the country has beyond doubt done very much to keep alive the efforts of the revenue officers to reach a true valuation of land. In the "Saharanpore Instructions" of 1855 it was laid down that the principal aim of the assessing officer should be "the equalisation of assessments." The ultimate aim of a precise valuation of agricultural land was to obtain for Government an equal share of the net produce from every part of it. But if we are constrained to admit that a perfect valuation of agricultural land by any method is an impossible task, we must also confess that the equalisation of assessment is no less unattainable. No one dealt more plainly with this matter than Colonel Baird Smith, whose arguments on this point, when pleading for the introduction of a permanent settlement, appear to have been worthy of more consideration than they received. His conclusion may be accepted that "the safest and best policy as regards the internal action of society is simply to leave it alone and let it assume its natural forms and conditions with the smallest amount of external interference that is consistent with good and efficient administration." The idea that artificial regulations can succeed in effecting and sustaining a perfect equality in the assessment of landed interests must indeed be rejected.

Equalisation considered unnecessary by Colonel Baird Smith;

is, in fact, unattainable.

Elaborate valuation of land must sooner or late cease.

28. If then it be admitted that the attempt to secure and maintain for purposes of assessment a thoroughly correct and complete valuation of land can rarely succeed; if it is true that settlement operations which have for their main object the correction of previous valuations of land cannot be undertaken without much harassment to the people and interference with agricultural progress, it will not be difficult to persuade your Lordship that a time must come in the fiscal history of every district and of every province when the renewal of a valuation of agricultural property on any elaborate system should cease. The conclusion at which we have

Value of work already performed by the Settlement Department.

thus arrived involves no intention to detract from the value of the work already performed by the Settlement Department, or to interrupt the completion of the task upon which it is already engaged. We owe to the Settlement Department of every province the greater part of the knowledge which we possess of the agricultural life of the people of India; we have received from it a careful description of every village and every estate in those districts through which it has passed. It has demarcated the boundaries of every property, and provided a map of every field. It has recorded the rights of every person, whether proprietor or tenant, who possesses an interest in the land of the country. If its labors had been confined to these matters alone, they would still have been a subject for pride and congratulation. But it has also achieved a result which is absolutely necessary to the Government for the attainments of the purposes now in view. It has furnished the administrators of the land revenue with a valuation of estates which in the face of the many difficulties recounted in previous paragraphs has been accomplished with wonderful success, and is, we believe, as at present conducted, as free from imperfection as it is possible for an official valuation of land to be. Without an initial schedule of the agricultural value of every estate the establishment of any reforms in the system of settlement would be impossible. The Settlement Department has, in a majority of the districts of the Upper Provinces, provided the Government with a schedule of this kind, and will within a few years have completed a similar task in the remainder.

Lord Northbrook's advice to arrange self-regulating system adopted.

29. What we desire is that the agricultural value of an estate, having once been ascertained with fair accuracy, may be taken as a basis for future adjustment without having recourse to periodical repetitions of a troublesome and vexatious investigation. For this purpose we are convinced that we shall do well in following Lord Northbrook's advice to arrange a self-regulating system upon the basis which the Settlement Department has already furnished or will shortly be able to provide. The main characteristics of such a system will be to adjust the Government demand upon facts, rather than upon estimates; to do away with the repeated valuations by the settlement officer, but not with the land settlement; to give security of property to the agricultural population, by letting them know exactly the conditions and limitations of future assessments, and to ensure to the public exchequer a reasonable share in the increase of agricultural wealth due to causes independent of the exertions of the agriculturists themselves. The settlement must be such as to secure to owners and tenants of land the profits of the improvements which they may make, and to allow them to form a safe estimate of the future value of their property.

Difficulty of the task,

30. The question is how to attain these ends. We do not disguise from ourselves the difficulty of the task. The objects before us cannot be accomplished by the rough and ready method of fixing the revenue at its present figure in perpetuity, for we acknowledge the necessity of ensuring to the State for all time a right to enhance its land revenue demand on certain fixed principles which we shall presently describe. But hitherto it has been difficult to see how periodical adjustments could be made without constantly renewed surveys and expensive settlement establishments.

diminished by recent establishment of Agricultural Departments,

31. It happens, however, at the present time that, with other objects and other ends in view, a machinery has been formed which will, it is hoped, enable us to solve the problem. The reasons which have led the Government of India to re-establish the Revenue and Agricultural Department, and to attach to the Provincial Departments of Settlement the new duties of agricultural inquiry required by the Famine Commission, have been made known to your Lordship. They had no immediate reference to any radical change in the system of settlement. We were influenced, firstly, by a sense of the importance of obtaining an accurate knowledge of agricultural facts for the general purposes of administration; and secondly, by a desire to lessen the excessive cost of periodical surveys and settlements, and to attain a greater accuracy in land assessments. The measures which we have undertaken for the accomplishment of these objects will now enable us to deal with reform in the settlement system itself. We agree entirely with the remark made by Sir Louis Mallet in his minute of the 3rd February 1875, that if there is one thing which is wanting in any investigation of Indian problems, it is an approach to trustworthy and accepted facts; and we are convinced that the absence of any record of facts upon which reliance could be placed has been hitherto one of the chief obstacles in the way of any improvement of the settlement system.

which will supply the knowledge of facts hitherto wanting,

32. It is a cause of much regret that a vast deal of the labor and money already expended by settlement officials in the arduous duty of framing a correct record has been lost through an unfortunate neglect to establish any sound system for its maintenance year by year. Elaborate schedules, carefully prepared by one set of assessing officers, have been placed on the shelves of the record-room only to be condemned as useless by their successors in consequence of the

perplexing and unrecorded changes which had occurred in the interval between the two settlements. Maps and records, which have cost the State a very large sum of money, have been permitted to lose the greatest part of their value by a failure to adopt the simple precautions necessary to maintain them up to date. "The whole of the uncertainty," wrote the Secretary to the Board of Revenue, North-Western Provinces, in 1873, "which affects our present assessment to such a serious extent might be swept away by a series of even tolerably accurate field statistics; but it is the fact that even in districts which have been lately under settlement, and in which records reconstructed at an enormous expense were handed over to Collectors, no measures are taken to keep them up to date." Evidence that the unfortunate neglect thus brought to light continues to be a blot on the administrative system of the north of India is found in the very latest settlement report which we have received from the Punjab. "Why," asks the writer, "should it be held in practice that such records are complete as soon as they leave the settlement officer's hands? It is obvious that they must always require adding to, and may require correction; why then should the settlement officer alone record his experience? Why should not the revenue officers carry out the orders of Government, and do so also."

by systematic maintenance of village records.

33. It was the absence of any organised system by which agricultural facts could be brought to the knowledge of revenue officials that mainly induced Sir John Strachey, at the express desire of the Secretary of State, conveyed in his despatch, No. 35, dated 29th April 1875, to establish a department in his province for the maintenance of an agricultural record; and the same cause led the Famine Commission to recommend the extension of the measure to other provinces. An able exposition by the Secretary to the Commission of the measures which in 1880 had been taken or were still required in each province for the proper collection of agricultural statistics finds place in Appendix I to the Famine Commissioner's report. The policy adopted by the Government of India, under the sanction of Her Majesty's Government, in re-establishing the Central Secretariat of Agriculture was directed to the same end. The first duty committed to the revived Secretariat was that of assigning to the united Departments of Settlement and Agriculture in each province the task of organising an efficient system of recording and maintaining agricultural statistics. In the Resolution of the 8th of December last, the primary efforts of the combined departments were directed to "the duties of gauging the stability of agricultural operations in every part of a province, of classifying the areas of the province according to the result of careful investigation, and of deciding what method of administrative treatment is suitable to each;" and it was laid down that a thorough knowledge of the circumstances of every village must be continuously maintained. These instructions have involved the annual record of the circumstances of every field in the temporarily-settled provinces, under the careful supervision of a properly organised staff, the construction of which is now being undertaken in each one of the provinces concerned. The Settlement Department will still therefore have its work to perform. Its duty as a valuer of land having been accomplished, it will in its new form continue to exercise the many other functions which are involved in the maintenance of a land settlement.

Statement of the problem before us.

34. In thus adapting existing machinery to the performance of those duties which are requisite to the working of a self-acting system of land revenue assessment, we are able to enter upon the difficult problem before us with some hope of success. The problem is how to give that assurance of security which is attached to permanency of the demand, without depriving the Government of its unquestioned claim to enhance the land revenue upon defined conditions.

Grounds of enhancement must be limited to three:—

35. After mature consideration we have arrived at the conclusion that a self-acting system of settlement cannot be established, if any increase of assessment is permitted on other than the three following grounds:—

Cultivated area.
Prices.
Improvements.

(1) Increase of area under cultivation.
(2) Rise in prices.
(3) Increase in produce due to improvements effected at Government expense.

Protection of private improvements.

36. We propose to abandon altogether any attempt to value or assess any profits which may, in future, arise from improvements effected by the people themselves, and in this category we of course include those made with the assistance of money borrowed from Government. Of such improvements in Upper India the larger portion consist of wells and other works connected with irrigation. Hitherto these have been too freely assessed. The rules laid down for their exclusion from assessment have not been liberal and, such as they are, have been greatly neglected. It is true that the right of Government to share in the profits of

Irrigation works.

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irrigation under certain conditions may be admitted. But we consider it so enormous an advantage to offer the strongest possible inducement to the agricultural population to protect the land against drought, that we are prepared to surrender the enhanced revenue which might be imposed on land irrigated otherwise than at the expense of Government.

Other Improvements.

37. The assessment of revenue upon profits of other kinds of improvements made by the agriculturists themselves would be unjust in itself and would involve those difficult inquiries into the valuation of land which we have resolved in future to avoid. This is especially the case in regard to the gradual enhancement of value effected by the application of greater labor and skill to the operations of tillage, heretofore an important item in the increment of revenue acquired by new assessments. We are convinced that it is false economy to discourage in any way the employment of such increased skill and labor, and are therefore prepared to resign any revenue leviable on the profits of improvements of this kind.

Initial assessment must be determined,

to the present revenues wherever adequate.

38. We now proceed to a consideration of the method in which the principles set forth in paragraph 35 are to be applied in introducing a self-acting settlement. The first step to be taken is to determine for each estate the initial assessment which is to be the basis of all future revisions of revenue. The question at once arises whether we are to accept as our initial assessments the present revenues, or whether we are to revise them. We are decidedly of opinion that the present revenues should be accepted in all estates in which this course will not involve a serious loss to the State. We have therefore to consider in what way we can, without a difficult inquiry, distinguish between the two classes of estates, viz., those in which the present revenue can and those in which it cannot be accepted as the initial assessment. On this matter we shall be ultimately guided by the advice of Local Governments, but we deem it nevertheless advisable to indicate to your Lordship the general lines which we are, as at present advised, disposed to follow.

They are adequate in all districts assessed since 1872 and in some before 1872.

39. The whole tenor of our present despatch has been to show the expediency of avoiding, as far as possible, the difficult operation of valuing land. We therefore propose to accept existing revenues as they stand, without an inquiry of any kind into the value or assets of each estate, in all districts in which the Local Governments are on general grounds assured that the present revenues are reasonably adequate. From information before us we believe that such is the case in all districts settled since 1872, and that we may, therefore, safely declare the present revenues of districts assessed after that date to be the initial revenues for the purposes of this scheme without any further inquiry. We understand that there are also a certain number of districts settled before 1872 which are known to be adequately assessed. The revenues of these also may, on a report from the Local Government concerned in each case, be accepted in like manner.

Inquiry necessary in districts where revenues are not adequate,

40. There remain those districts in which there is not sufficient assurance that the revenues are generally adequate. In these some sort of inquiry, estate by estate, is necessary for the purpose of ascertaining whether or not the revenue is adequate. The test of adequacy will be the proportion borne by the present revenue to the existing assets in each case.

but need not be elaborate if records are in fair order.

41. But we do not propose that the inquiry undertaken for the ascertainment of the existing assets should be of that elaborate kind which has hitherto characterised land settlement revisions. In all districts in which records are in fair order the matter will be very simple; there need perhaps be no local inquiry at all in such districts if, as we would propose, the assets recorded in the village papers are accepted as the existing assets, with the necessary correction involved by applying the recorded rent rate to land held by proprietors or grantees.

If not in fair order resurvey and revision are necessary

42. There will then be left only those districts in which records are incomplete, and in which, therefore, the village papers, as they stand, afford no basis for the calculation of existing assets. In such districts a resurvey and revision of the record will be inevitable before the existing assets can be ascertained. But the main object of the revision of maps and records will not as heretofore be that of effecting an elaborate valuation of land. The settlement officer's operations will in all parts of the country, in which the landlord's income depends chiefly upon rents, be directed primarily to the record of the acknowledged rents, and not to an estimate of what, in his opinion, the rents ought to be.

Three classes of districts have been described.

43. We have thus described three classes of districts :—

(1) Those in which the revenues can be summarily accepted at once as the initial revenues. They will comprise more than half the districts in the North-Western Provinces, Oudh, and the Punjab.
(2) Those in which the revenues of many estates are unduly low, but can be summarily estimated upon an examination of the village papers. This class will probably be confined to a few districts in the North-Western Provinces and Oudh.
(3) Those in which no estimate of the revenues can be made without a resurvey and revision of the record. This class will include all districts in the Central Provinces, and a few only in the provinces of the Punjab and the North-Western Provinces and Oudh.

Revenue will only be raised if low when compared with the assets.

44. When the assets of each estate in classes 1 and 2 have been determined by the comparatively simple process already described, they will be compared with the revenue of the estate. If the latter is found to be unduly low, it will be raised, but not otherwise. We will not, in this despatch, discuss the grounds upon which a revenue should be deemed unduly low. Each Local Government will be required to frame rules for its province under which the adequacy of a revenue, or the proportion which it should bear to the existing assets, should be determined. But it will be provided that no increment in the revenue of any estate, assessed at an unduly low rate, will be collected until the termination of the current contract.

Initial assessments having been fixed, future adjustments how to be arranged;

45. We have in the preceding paragraphs indicated the manner in which it may be practicable to establish our initial revenues without elaborate inquiry and without disturbing the existing contract between the Government and the proprietors of land during the currency of the settlement. We have now to explain to your Lordship the method by which it may be possible, without involving the recurrence of vexatious inquiries, to arrange for future adjustments of the revenue demand. Reverting to a consideration of the three conditions by which in paragraph 35 we have proposed to restrict the enhancement of the land revenue, we may ask your Lordship to accept our conclusion that the alteration of the Government revenue in connection with improvements effected at the expense of Government is not one which need be particularly discussed on the present occasion. It will perhaps be considered sufficient that we should state that the Government has no intention of resigning the fair profits due to works of irrigation and agricultural improvements, constructed out of the taxes of the general community, provided that it be understood that the contruction of railways or works of that kind will not constitute a ground for enhancing the land revenue except in so far as it causes a rise in price. We have, therefore, at present only to deal with the adjustment of the demand on account of increase in the cultivated area or of rise in prices.

in accordance with changes in the cultivated area by determining an initial area for a given year,

46. In dealing with the cultivated area, we think it will be desirable to allow the Local Governments to fix for each district a year in which the cultivated area shall be taken as the initial area upon which all future adjustments will be made. The initial revenue would be arranged for the same year as that for which the initial area of cultivated land is recorded, although, as previously explained, no increment will be actually collected until the termination of the present contract. In districts of the 1st class above described the year chosen would, if these proposals are sanctioned before the expiration of many months, probably be the year now current. In districts of the 2nd class the examination of the village papers might require some delay, but not, we think, more than two or at the most three years. The year chosen would in that case not be later than 1885. In districts of the 3rd class the arrangement cannot be effected until the completion of the new survey.

and by fixing rates to be assessed on land newly cultivated.

47. The initial area having been established, fixed revenue rates will be laid down for the future assessment of uncultivated land. Care would be taken that they should be moderate. The rates thus fixed would not come into force until the time for the revision of settlement arrived. The revenue of newly-cultivated land would then be calculated and levied at those rates. We think, however, that it may be desirable in some cases to avoid making any addition to the Government demand on account of new cultivation, unless the increment exceeds a certain percentage of the initial area. On this point we should have to be greatly guided by the advice of Local Governments.

Period of settlement 20 years.

48. The period for which revised assessments should in future run need not, we think, be precisely determined at present. But we are inclined to believe that a term of twenty years will probably be found to be most suitable. The rapid progress which the country is now making in railways, canals, and other works which foster the extension of agricultural enter-

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prise will in many parts of India give rise to so great a development in the value of landed property that it would probably be both difficult and unwise to demand anything like a proportional increase in the revenue after so long a period as thirty years. In this matter also each Provincial Government should have a voice, and the question must be referred to them.

To be adjusted thereafter in accordance with change in prices.

49. As to the manner in which the revenue is to be periodically adjusted in relation to changes in the value of produce, we are not prepared to enter into details in this despatch. As in the case of the revenue and cultivated area, so in the matter of the prices an initial schedule must be prepared, by reference to which future adjustments of the revenue will be made. This initial schedule will be based not on the prices of any one year, but on the average prices of a period of years, say ten, immediately preceding the year which is taken as the commencement of the settlement. The staples which are to be taken into consideration, the markets at which prices are to be registered, the period for which the average is to be calculated, and the like—are matters which must be decided in consultation with the local Governments.

It is sufficient to say that after a careful consideration of the subject we see no difficulty in arranging these details on a satisfactory basis.

Revenue will not be increased for small rise in prices, nor beyond certain limits.

50. There is, however, in connection with this subject one question of sufficient importance to be mentioned in this place, and that is, the question whether every rise of prices, however small, will justify an increase of the revenue at the time of the periodical adjustment; and whether the revenue can be raised in full proportion to the rise in prices without any limit. This is a matter of principle which we have attentively considered. It can hardly be doubted that to the mass of the people a settlement based on a distant and incalculable contingency would mean uncertainty, and would be looked on with suspicion. It appears expedient also for many reasons at each periodical revision to leave untouched a margin of the profits arising from increase of prices with the view both of raising the standard of living among the agricultural classes, and of meeting the increasing cost of labor, stock and implements. For these reasons, as at present advised, we think that a point may be fixed to which prices must rise before the revenue is enhanced on this ground, and that a limit, say 15 per cent., may be laid down to any increase of revenue to be made on the ground of prices at any one time. If some such lines as these are followed, we are of opinion that as much certainty will be given as is possible without fixing the revenu eunalterably for ever.

Present reforms conceived in the interests of owners,

51. We have stated in the above paragraphs the principles on which we wish to base future revisions of the land revenue. If these principles are adopted, there can be little doubt that the value of landed property will rise considerably owing to the complete protection thereby given to improvements effected by the owners of land, and owing also to the security which the proposed system will afford against large and sudden enhancements of revenue.

The improvement of the system of assessing land to revenue has indeed been our chief object in proposing these measures, which have, in the first instance, been conceived entirely in the interests of the owners as distinguished from the occupiers of land.

but necessitate protection of occupiers of land;

52. It is, however, our desire, in anything that may now be done, to avoid the mistake of looking to the rights and interests of only one of the parties concerned. Of the evils which may result from a settlement of the land revenue in which the interests of the tenants have not been sufficiently considered, we have an example in Bengal, and it is only necessary on this point to refer your Lordship to the recent correspondence regarding the Bengal Rent Bill. It is true that the proposals we are now making do not amount to a completely permanent settlement of the revenue. They go, however, a very long way in that direction, inasmuch as they limit future assessments by fixed principles, and to that extent will be binding on future Governments. There is no doubt that the periodical revision of the revenue, as at present practised, operates to some extent as a check on the rack-renting tendencies of bad landlords, and that this check will be removed if the principles now advocated by us are adopted. We wish, therefore, emphatically to state that a fair and reasonable measure of protection to all tenants is, in our opinion, a necessary condition of the proposals now made. Unless the benefits which a better system of assessment is calculated to secure can be in some degree extended to the tenants, we do not care to move in the matter. There is no doubt that our proposals involve a sacrifice of future revenue, and we are not sure that we should be justified in incurring this sacrifice solely in the interests of the land-owners. If, however, the advantages can be passed on to the agricultural classes generally, and a substantial improvement effected in their condition, the prospective loss of revenue becomes a matter of comparatively small importance.

in what manner is for future consideration.

53. In what manner this object can be best attained, what form of protection may be most suitably adopted, we are not yet in a position finally to determine. Our view is to limit enhancement of rent where possible to the same grounds as those on which alone it will be in

the power of Government to enhance the revenue, and to some extent to maintain a similar proportion in the amount of enhancement. This can only be done effectually by combining it with a certain fixity of tenure in the case of tenants of the classes now unprotected by the law; but whether this can be done by absolute prohibition of ejectment, except for arrears, or by compensation for disturbance, or by any other means, depends greatly on the existing conditions of tenant right in each province. In this respect the circumstances of each province are materially different, and it is more than probable that no one measure can be devised which will suit all. It is enough here to state that the measures proposed with the view of giving a character of permanency and certainty to the land revenue must, if adopted, be accompanied by measures for giving a certain fixity of tenure to the ryots, and for securing them against oppressive rents. The two matters are, in our opinion, inseparable. What those measures of protection shall be must be determined by us in consultation with the local Governments, with due consideration to the special circumstances of each province.

54. We wish, before closing this despatch, to place on record a distinct intimation that in the measures we now bring forward we do not intend to do more than to limit the grounds on which land revenue itself is to be enhanced, and that the liability of land-owners, either to bear a share in local or provincial cesses, or in any general taxation which it may be necessary to impose, remains altogether unaffected by the proposals herein contained.

55. Finally, we desire to explain to your Lordship that we are aware that the present communication is wanting in many details. These we shall be prepared to provide if the general outline of our proposals meets with your Lordship's approval. We have seen and consulted the Lieutenant-Governors of the North-Western Provinces and of the Punjab about these matters, and have, after receiving their opinions, convinced ourselves that, until an expression of your Lordship's opinion on the main issues of our proposals has been received, it will be difficult to elaborate the minor details of the scheme. We trust, therefore, that your Lordship will consent to accord approval to the principles upon which the system of self-regulating settlement or adjustment of revenues is under the present proposals to be based.

Despatch from the Right Honorable the EARL OF KIMBERLEY, Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India Office, London, 22nd March 1883, No. 24 (Revenue) :—

I have considered in Council, with the attention demanded by the importance of the subject, your Excellency's letter of the 17th October last, No. 17 (Revenue), proposing for my approval principles in accordance with which you think that the existing system of the revision of periodical settlements of the land revenue in Upper India should now be modified.

2. These principles involve, in the first place, the final abandonment of the policy of a permanent settlement of the land revenue in cash. The adoption of that policy was decided on by Sir C. Wood in his despatch, No. 14 (Revenue), of 1862. But, after the long discussion summarised in paragraphs 12—17 of your letter, its execution was suspended by the Duke of Argyll (despatches, Nos. 24 and 26, of 1871), pending a reconsideration of the whole question, in accordance with recommendations of the then Government of India and of the Select Committee of the House of Commons on Indian Finance.

3. The report of the Government of India called for by the Duke of Argyll has not, for reasons stated in paragraph 19 of your letter, been received, although the Secretary of State has learnt from a compilation of papers transmitted in 1874, ending with the letter of the Lieutenant-Governor, North-West Provinces, dated 2nd March 1874, the result of the inquiries under-taken with a view to its submission. And I presume that your present letter is to be under-stood as in substitution of that report.

4. Under these circumstances, it is desirable that I should state briefly the reasons which have led me to concur in your decision to reject the policy of a permanent settlement pure and simple. I shall not, however, refer to the practical difficulties of the measure, which have been amply discussed in India, and have been shown to be great. I shall merely consider whether the experience of the last 20 years supports the views on which Sir C. Wood's despatch of 1862 chiefly based that policy.

5. It was believed in 1862 that no material increase was possible in the revenue of tracts then pretty fully cultivated. Now the increase in the land revenue receipts between 1861 and 1881 has been about 2,500,000*l.*; that is to say, temporarily settled revenue has risen in 20 years about 17½ per cent. Great part of this increase, it is true, is due to the extension of cultivation which will not recur in the same degree; but, on the other hand, the proportion of assets taken as revenue has been lowered in Upper India from two-thirds to one-half, while some original settlements elsewhere have reduced the demand. The increase of the rental of Bengal since 1793 affords a still more striking illustration of the possible sacrifice of future revenue which a perpetual settlement may occasion. It is estimated that the net rental left to the landlord classes by the permanent settlement has increased 14 times, and that the gross rental, including the fixed Government revenue, has more than trebled in three generations. It appears

to me therefore that, even with the strict and careful limitations of enhancement of assessments which your proposals involve, the temporarily-settled revenue may reasonably be expected to rise by something like 5 per cent., or say by 750,000*l*., each decade. I need not point out of what importance such an increase will be to meet the growing cost of necessary reforms and of improved administration.

6. It must, moreover, be borne in mind that the fiscal policy of India has been materially changed since 1862. Import duties as such have been abandoned; the salt-tax has been lowered; the income-tax has been abolished; the license-tax is comparatively small; and the stamp-taxes are not likely to be enhanced. The rates of excise revenue are nearly as high as they can be, and an increase in its yield from larger consumption of liquor or drugs is not desirable. There are, therefore, few existing taxes, the proceeds of which would be likely to be considerably augmented by the possible increase of wealth arising from the introduction of the permanent settlement. At the same time, the general popular discontent which might be caused by the imposition of new taxes, needed to meet growing requirements of public expenditure, in the absence of the normal growth of the land revenue, would probably outweigh the advantages of such a settlement.

7. The expectation entertained in 1862 that fixity of the Government demand on the land-owners would lead to more considerate treatment by them of their tenants, and would thus promote the prosperity of the cultivators generally, has not been confirmed by the results of the recent discussions on the Bengal Rent Law; while it does not appear to be generally admitted that the agricultural population of the permanently-settled districts of the North-West Provinces is more prosperous than that of the temporarily-settled districts.

8. Finally, it was thought that a permanent settlement must certainly be advantageous to the existing land-owners. In Bengal it was not so. Most of the zemindars with whom the permanent settlement was made were ruined within a generation. There were doubtless special causes of this. But I cannot but think that the general introduction of a permanent settlement would intensify the tendency to a transfer of the ownership of land from the agricultural to the commercial classes. In the greater part of India the economical effects of this change would be so doubtful and the political risks so great that it is not expedient to take any step which may promote it.

9. For these reasons I concur with your Excellency's Government that the policy laid down in 1862 should now be formally abandoned. But, on the other hand, you are equally opposed to periodical, complete, resettlements. You consider that only the most prominent of the evils attending them are "the uneasiness arising from uncertainty, the harassment of the agricultural classes, the discontent engendered by mistaken assessments, the check to expenditure on improvements, the positive deterioration of agriculture in the last years of the term of settlement," to which I may add the heavy cost and great delay involved in the operations. My predecessor has expressed similar views, and I need only say that I concur in them.

Vide Revenue despatch to Bombay, No. 29 of 1879.

10. You seek, therefore, a system which shall secure the advantages and avoid the evils of the other two systems; which, while insuring to the public exchequer a reasonable share in the increase of agricultural wealth due to causes independent of the exertions of the agriculturists themselves, shall give security of property to landholders, and shall make the conditions and limitations of future demand clear to them. Such a system you think can be framed upon the principles you now recommend for my approval.

11. You call this system, I must first remark, a self-acting or self-regulating one. The expression appears to me hardly appropriate, for, as you show, it will need on the part of the officers employed to revise assessments, and of the Government much care, attention, and discretion. Nor can I conceive any method by which these requirements can be dispensed with.

12. You lay down two principles as the basis of your scheme. First, that a reasonably fair and equitable assessment of an estate at a given time having once been arrived at, that assessment, which you call the initial assessment, shall not be altered on revision with the view of establishing under changed circumstances an equality of incidence with the assessment of other estates. This principle has, in effect, been already accepted by my predecessor, and subject to the observations made below (paragraph 26), I approve it. Second, that no improvements of any kind made by the landholders, owners or tenants themselves shall be taken into account in revising assessments. This principle is embodied in the land law, or is admitted in the settlement rules in almost all parts of India, and I approve it without qualification.

Vide Revenue despatch to Bombay, No. 14 of 1881.

13. You also point out that the success of the measures you propose depend upon the establishment, where it does not already exist, of an efficient system of agricultural statistics and village records. The steps which, with the approval of my predecessor, you have taken for the formation of an agricultural department under each Government will, you believe, secure this object.

14. The scheme you propose is, as you explain, merely sketched. Its details will be elaborated in consultation with the local Governments, and with due regard to local circumstances, when my approval of the general principles on which it is based has been received; but a general outline of it appears to be as follows.

15. The first step is to decide the initial assessment to be taken as the basis of future revisions. For this purpose you divide the districts of Upper India into three classes :—

(1) Those resettled generally since about 1872, in which the local Government is assured that existing assessments are now fair and adequate. This class, you believe, will comprise the greater part of the North-West Provinces, Oudh and the Punjab. In it the existing is to be assumed as the initial assessment.

(2) Those probably confined to a few districts in the North-West Provinces and Oudh, in which the local Government believe that the existing assessment is decidedly inadequate as compared with the actual assets. In this class you propose that the existing assessment shall be, on a summary examination of the village papers, raised nominally to a fair sum, and that sum assumed as the initial assessment. I am not certain of the exact meaning of this proposal, but it would seem to be this :— On an estate, the actual assets of which are now shown by summary inquiry to amount to Rs. 1,000, while the assessment is only Rs. 300, or 30 per cent. instead of 50 per cent., the initial assessment will be assumed to be Rs. 500, and on the expiration of the current settlement it will be considered whether not Rs. 300 but Rs. 500 shall be enhanced on General considerations.

(3) Those districts, the whole of the Central Provinces, and a few districts elsewhere, in which the existing settlement is so inadequate, imperfect, or inequitable that no initial assessment can be arrived at without a regular revision. Even in this case revision operations should, you think, be simplified.

16. I entertain some doubt whether these proposals are in all respects judicious. As regards the second class, you, in effect, propose to declare in 1883, not only on what principles assessments are to be revised, but also what will be on the expiration of the current settlement, perhaps 20 years hence, the amount of an assessment to be imposed under any circumstances, and which may be still further enhanced. The proposed summary inquiry seems to me not unlikely to lead to erroneous results, especially in the case of estates largely cultivated by the proprietors, and where the village papers will not show the actual rental. And in that case the total prospective enhancement arrived at may be an injudicious or oppressive one.

17. I desire therefore that, in framing the details of your system, you will consider whether it will not be better to omit the Central Provinces, as these territories, it is acknowledged, must have a regular revision ; and as regards other parts of Upper India, to declare now the general rule that current settlements shall in future be revised only to the extent and on the the principles approved in the following paragraphs ; but that it is left at the discretion of the Local Government, before each settlement expires, to represent to the Government of India that the district or part of it requires more complete and systematic revision, subject, of course, to the rule that improvements of the land-holders are not to be taken into account. If, as I think should be the case (paragraph 26 below), the enhancement be not necessarily an uniform one throughout a district, so that estates hitherto assessed particularly lightly may receive a somewhat higher proportionate enhancement, cases of the exceptional treatment of districts or estates will probably not be numerous. It is another argument in favor of this course that the village records on which you rely for information as to whether an estate should be treated exceptionally or not ought to be more trustworthy some years hence than they can be now.

18. The initial assessment having been determined, the principle which you propose is that it shall be enhanced on revision on three grounds only :—

(1) Increase of cultivation.
(2) Increase of produce due to improvements made by the State.
(3) Rise of prices.

Subject to the following remarks, I approve this principle.

19. As regards the first ground, you consider that a small extension of cultivation beyond the initial area should not be taken into account. Beyond this, waste land, if brought under the plough, will be assessed when the current settlement expires at fixed and moderate rates which will be now laid down. This plan, apparently borrowed from the ryotwari systems, involves questions of detail which may be left to your further consideration in consultation with the Local Governments.

20. As regards the second ground of enhancement, you intend to lay down the rule that no State improvement which does not directly increase the quantity of produce shall constitute a ground for enhancement, save in so far as it causes a rise in price. In the case of a village which used to suffer from want of drinking water, but is near a new tank or canal, there can be no doubt that, irrespective of any question of prices, the value of the estate is raised as compared with that of a similar village a few miles from the water-supply. Again, an estate close

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to a station on a new railway is benefited more than one of ten or twenty miles distant. The advantage in this case may be ultimately resolved into one of price, but it is not one which can appear in the price returns on which the settlement officer must act, since the gain to the cultivator is not one of increase of market price, but of saving in carriage. The argument applies equally to any saving in the cost of production which is not general, and you will therefore, on further consideration no doubt, conclude that the proposed rule goes somewhat too far.

21. The third is by far the most important of the three grounds of enhancement. You propose, in the first place, that assessments shall not be enhanced on account of a trifling rise in general prices; secondly, that enhancement on account of a more considerable rise shall not exceed a certain limit, say 15 per cent. You think also that enhancement should not be in full proportion to a rise in prices; that it will be expedient to leave a margin with the view of meeting any increase in the cost of agriculture, and of providing for a rise in the standard of comfort. Subject to these limitations, there will, you believe, be little difficulty in arranging the details of a scheme by which assessments shall rise on revision with rise of prices. Your intention appears to be, having decided what staples and markets are to be adopted for the purpose of the calculation, to take as the initial price the average price of, say, ten years before the introduction of the current settlement, and to compare this with the similar average price for its last decade.

22. These views I in general approve, but in framing the details of your scheme I request your careful consideration of the following observations:—

First.—Scarcity prices, you will agree with me, ought certainly not to be taken into consideration as a reason for enhancement. I presume, therefore, that years of famine will be carefully excluded from the series on which average prices are to be computed.

Second.—The danger of regulating assessments with reference to average prices is that assessments low during a series of years of high prices may be raised on the average prices so obtained when the series is at an end and a cycle of years of low prices has set in, so that practically assessments will be in inverse ratio to prices. The excessive oscillations of prices in India make this danger an appreciable one, as, you are aware, recent experience of the Deccan settlements has shown. Still, however, there can be no doubt that there is a steady tendency in India to a rise of prices. The greater abundance and efficiency of the circulating medium and the development of means of communication, which tends to bring prices in India more nearly to a level with those prevailing in the countries to which she can export her produce, are causes which must produce this effect. Where, therefore, the land is largely cultivated by its proprietors and actual rent payments are rare, the course of prices must be the principal guide, though one to be used with great caution.

But *thirdly*, in tracts where land is generally let to tenants for cultivation there is the difficulty, one much insisted upon in the North-West Provinces discussions of 1872, that where rents are much regulated by custom they, and consequently assessable assets, do not necessarily vary in proportion to variations of prices. Hence Sir W. Muir* recommended that assessments should be enhanced in some proportion to, not a rise in prices alone but, a general rise in the letting value of land, the mode of ascertaining which he pointed out. This the improvement in the village records will render easier, and where, as in Oudh, land is generally let, I am disposed to think Sir W. Muir's the safer method.

* His letter of 2nd March 1874.

23. There is one other consideration, alluded to in paragraph 8 of your Resolution of 4th October 1881, which is undoubtedly of much importance in deciding on enhancements of assessment. I mean the revenue history of the tract or estate under revision. Your scheme necessarily assumes that the initial assessment is fair, but this is not really always the case, as indeed the instances cited in the appendix to your letter sufficiently show. However carefully a settlement may have been made, nothing but experience can show whether it is really a fair one. If a district or an estate has not prospered during the term of the expiring settlement, if cultivation has not extended, if stock has not increased, if the people have grown poorer, if the original settlement proprietors have largely lost their proprietary right, if there has been much difficulty in realizing the revenue, the settlement officer may be pretty sure that the assessment ought not to be enhanced even though general considerations should indicate an increase.

24. If it is intended to impose an uniform percentage enhancement arrived at on the general considerations which are to guide the settlement officer, upon all the estates included in the settlement under revision, I am not sure that this principle is correct. On the one hand,

public improvements may have specially affected particular estates; on the other hand, particular estates or tracts, especially the less fertile ones, may clearly have been assessed disproportionately high by the settlement under revision; or their general state of prosperity may not justify the imposition of the usual rate of enhancement. I would therefore desire you to consider whether the method should not be that of determining, upon the principles you advocate, the general enhancement of the tract under revision, and of distributing that enhancement over the estates comprised in it in accordance with the circumstances of each, which it is the object of the improvement in village records to enable the settlement officer readily to ascertain.

25. I observe that your proposals relate to Upper India only; they are, however, it appears to me, equally applicable, *mutatis mutandis*, to the ryotwari settlements of Madras and Bombay. A scheme closely resembling that which you propose was unsuccessfully advocated by the Government of Madras in 1868, and my predecessor in despatches of the last two or three years has urged principles in all essentials similar upon the Government of Bombay. I would suggest, therefore, that you should consult the Local Governments of Madras and Bombay whether the principles now approved may not be extended to those Presidencies, with such modifications as may be required by local circumstances.

26. I entirely concur in the views expressed in the 54th paragraph of your Excellency's despatch that the liability of land-owners, either to bear a share in local or provincial cesses, or in any general taxation which it may be necessary to impose, remains altogether unaffected by the proposals now approved.

27. In your 51st and following paragraphs you state your views upon a collateral and extremely important subject,—that of the protection of tenants, in its connection with the question of the principles of settlement. The policy you now propose has, you say, been conceived entirely in the interests of owners as distinguished from those of tenants; but a fair and reasonable measure of protection to all tenants is, you think, a necessary condition of it; the two questions are inseparable, and unless the benefits of the new land system can be extended in some degree to the tenants, you do not care to move in the matter. The particular measures of protection to be adopted for each province must be settled after local inquiry and in consideration of local circumstances; but, speaking generally, you consider that rents should be enhanceable only on the same grounds as and in some proportion to enhancement of revenue, and that tenants now unprotected by the law shall receive a certain fixity of tenure. And you ask in effect that, in accepting your proposals as to the future principles of the land revenue demand, I shall approve your views on the question of tenant right.

28. While I fully sympathise with you in your desire to make the agricultural population generally sharers to the greatest practicable extent in the benefits which a better system of assessment is calculated to secure to the country, I could not sanction the announcement of any policy on so important and difficult a subject as tenant right for any part of the empire until the facts and proposals had been fully laid before me, with the views and opinions of the local authorities.

29. The circumstances of the agricultural community, and the laws and customs on which the relative rights of the various agricultural classes rest, vary greatly in different provinces. In some (as the North-West Provinces and the Punjab) the law has within recent years been settled on a basis generally recognised to be upon the whole satisfactory. In others, the law is now under revision irrespectively altogether of the question of settlements. Elsewhere (as in Oudh) we are bound by concessions, engagements, and laws, which render it necessary to proceed with the utmost caution and deliberation.

30. It is obvious, therefore, that if any change be proposed as regards tenant right, the subject must be treated on its merits in each province.

31. I so far agree with you, that I am of opinion that the introduction of new arrangements in respect to settlement which offer special advantages to the zemindar and superior holder affords a fitting opportunity for making any change which may be thought desirable in favor of the tenant; but I am unable to concur in your view that the one reform must be treated as inseparable from the other.

32. Unless, therefore, the Local Government of any particular province is of opinion that the opportunity should be taken for adopting measures of additional protection to tenants, I see no reason why on that account you should delay the introduction of the principles of assessment now approved, which are sound in themselves and will confer great benefits on the agricultural community.

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ORDER—dated 23rd January 1884, No. 120, Revenue.

Land Revenue, No. 12.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture with reference to G.O., 13th August 1883, No. 975.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.

Exd. T. O'Connor.

70 Copies.

In No. 386/84

Gobt. of {1884} Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 23rd January 1884, No. 120.

JANUARY.

Land Revenue Assessments.

Letter from the Government of India forwarding copy of correspondence with the Secretary of State regarding the principles which are in future to regulate the revision of — in Upper India, communicated to certain authorities.

A 581/27

Communicated to the officers in charge of Parties in continuation of this office No. 2242 dated 11th September 1883

(By Order)
[signature]
1st Assistant

Dept: of Rev. Settlement & Agriculture
Madras 22nd February 1884

To

The Deputy Director of Rev. Settt. Party No. III

9TH FEBRUARY 1884, NO. 207, REVENUE.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 24th January 1884, No. 245:—

Read—the following letter from C. S. CROLE, Esq., Collector of Madura, to the Secretary to the Board of Revenue, dated 19th January 1884, No. 32:—

I have the honor to submit, for the information of the Board, a copy of the report furnished by Mr. Levinge on the condition of the Amrat Mahal cattle in his charge.

2. It will be observed that the whole herd suffered from foot-and-mouth disease which prevailed last year all over the hills, and that the bull entrusted to the Nattamaigar of Vilpati fell a victim to the disease. But, under the very careful treatment by the gentleman in charge, the rest of the cattle got over the epidemic without casualty and are now doing well.

3. At the commencement of last year the herd consisted of nineteen head. It had increased to twenty-two when I submitted my last report in May 1883. Now there are twenty-six animals.

4. Mr. A. W. Turner has not as yet sent in his report on the cattle placed under his charge. As soon as I get it from him, I shall submit it to the Board.

ENCLOSURE.

Letter from V. H. LEVINGE, Esq., to the Collector of Madura, dated Kodaikánal, 7th January 1884.

I have the honor to make the report required by Government on their Amrat Mahal cattle in my charge for the year 1883.

During the past year a serious outbreak of foot-and-mouth disease occurred all over these hills, and the bull which was in charge of the late Nattamaigar of Vilpati died of it; nearly all the cattle in my charge suffered from it, but there were no casualties amongst them, and only one of the cows was ever in any danger from it. She had to be fed on cumbu-kanji for a few days as she could not eat, and she finally got over it.

The only remedy I know, and which I used, was to wash out their mouths with a lotion of one tablespoon of carbolic acid to one bottle of water.

The feet were washed with the same lotion and afterwards rubbed with a mixture of 1 oz. carbolic acid to 8 oz. common country castor-oil.

At present the herd are all well and the young ones bred now promise to grow into as good beasts as the original stock.

At the beginning of last year the herd consisted of one bull and nine cows, the original stock; one young bull, five bullocks and three heifers their produce—total nineteen head.

In the past year seven calves were born, viz., five heifers and two bulls—grand total of herd twenty-six head.

Resolution—dated 24th January 1884, No. 245.

Submitted for the information of Government.

2. As the bull died during the year, the present number of the herd must be twenty-five and not twenty-six as stated by Mr. Levinge.

(True Copies and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Collector of Madura.

Order—dated 9th February 1884, No. 207, Revenue.

Miscellaneous.

Recorded.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, Director of Revenue Settlement and Agriculture.
,, Military Department.

Exd. J. Henricus.

70 Copies.

In. No. 483/84

Govt. of {1884} Madras.

REVENUE.

No. 468

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 26 February 1884

(By order)

[signature]
1st. Assistant

To,
The Dy. Director of Reve: Sette.
Party No. III

Issued

Recd. Encl.

G.O., 9th February 1884, No. 207.

FEBRUARY.

Amrat Mahal Cattle.

Report on the — in charge of Mr. Levinge for 1883, recorded.

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following Proceedings of the Board of Revenue, dated 10th November 1883, No. 3387 :—

Abstract.—Submitting to Government, with remarks, annual report of the Conservator of Forests, Southern Circle, for 1882-83.

Read—the following Proceedings of the Board of Revenue, dated 15th November 1883, No. 3462 :—

Abstract.—Submitting to Government, with remarks, administration report of the Conservator of Forests, Northern Circle, for 1882-83.

Order—dated 21st January 1884, No. 101, Revenue.

Forest, No. 14.

With these proceedings the Board of Revenue submit separately the annual reports of the Conservators of Forests for the year 1882-83. It will be more convenient if, in future, both reports are reviewed simultaneously, and the Board are requested to make arrangements accordingly.

2. *Leading Events.*—The year under review was the first of the provincialisation of the Forest revenues. The principal event was the coming into force of the Madras Forest Act V of 1882 on the 1st January 1883. Shortly before this took place the Jungle Conservancy Fund was amalgamated with Provincial, Forests and Jungle Conservancy operations placed under the charge of the professional department. The staff of the Forest Department was at the same time strengthened and reorganised, and the Presidency divided into two circles, the Southern, comprising eleven districts and *fifteen* forest charges, being placed under Major Campbell Walker as Senior Conservator, and the Northern with *ten* districts or charges under the Junior Conservator, Mr. Gamble. The whole administration was placed under the control of the Board of Revenue, Collectors being constituted the heads of the department within their districts, the District Forest Officers, their Assistants, and the Conservators consulting and inspecting officers with authority in matters of finance and establishment.

3. *Inspection Tours.*—During the year under report the Senior Conservator visited all his districts with the exceptions of Chingleput, Tanjore and South Canara, and the Junior Conservator, who was in charge only for the last three months of the year, the Ceded Districts and the Nílgiris. The District Officers were commendably active in touring, especially Mr. Brougham who appears to have spent no fewer than 284 days of the year in camp.

4. *Reserved Forests.*—According to Statement I the extent of forest treated as reserved prior to the passing of the Act was 1970·331 square miles in the Southern

and 812 square miles in the Northern Circle. These totals are of course only roughly approximate, many of the so-called reserves having never been surveyed. The last-mentioned figure excludes the Nallamalai reserves in Kurnool and the Nílgiri sholas and slopes towards Coimbatore and Malabar, which have not yet been demarcated and the area of which cannot even be roughly estimated. Some 35,550 acres in the Kadiri, Madanapalle and Váyalpád taluks, which were included under Reserves in the previous year, are stated to have been transferred to other heads, but to what heads does not appear. Besides these reserves, Mr. Gamble points out that in the Northern Circle (and the remark applies equally, no doubt, to the Southern Circle), there are very extensive tracts of country which have hitherto been under Jungle Conservancy management and from which further reserves may be selected. An attempt has been made to estimate the area so available in seven out of the ten districts of the Circle, but the result is confessedly of very doubtful accuracy.

5. Some 7,719 acres are shown as "village forests" in the taluks of Proddutur and Jammalamadugu, and large areas are stated to have been set aside for the same purpose in other taluks of the Cuddapah District. The Government desire to receive further information as to the nature of the arrangements made and the system under which it is proposed to administer these tracts.

6. Of leased forests there are only two, the first of 200 square miles leased from the Rajah of Mudumalai for an annual rental of Rs. 3,500; and the second, comprising $62\frac{1}{2}$ square miles, leased from the Rajah of Sandúr for an annual rental of Rs. 10,000.

7. *Fire Protection.*—During the dry season of 1882-83, 218,614 acres were protected in the Southern Circle at a cost of Rs. 4,763, and 155,871 acres in the Northern Circle at a cost of Rs. 5,359. The work of protecting the Sandúr forest appears to have been carried out with especial success and does great credit to the District Forest Officer, Mr. Hooper. Some account should have been given in the report of the Southern Circle of the fires which occurred and of the degree of success attained in preventing them during the year. The District Forest Officers of Ganjam and Nellore should be called upon to explain the large expenditure incurred in those districts under this head.

8. *Plantations and Topes.*—The return of regular plantations gives the area in the Southern Circle as 36,027 acres and that in the Northern Circle as 8,950 acres, while in the latter circle $10,262\frac{1}{2}$ acres are shown as the total area of topes, and in the Southern Circle 7,709 acres are described as "under cultural operations." The latter phrase is apparently intended to indicate topes and similar small plantations, and it will be convenient in future to class all such as topes and to exhibit them in a separate statement.

9. *Departmental Working.*—The total value of timber felled and removed to the sale depôts, including minor produce so removed, was Rs. 39,460 in the Southern and Rs. 51,910 in the Northern Circle. In addition to this, Rs. 59,613 worth of timber is shown as removed to forest depôts, and Rs. 6,875 as lying in the forest in the Southern Circle. For the Northern Circle similar information is not furnished, except for the Nellore District owing, it is explained, to insufficient information. In the Southern Circle timber, valued at Rs. 1,38,526, was sold for Rs. 1,93,183, and in the Northern Circle timber valued at Rs. 79,533 for Rs. 1,09,586. The valuations appear to have been particularly low in Nellore and Coimbatore. The attention of the Public Works Department will be drawn to paragraph 15 of Major Campbell Walker's report and paragraph 10 of the Board's proceedings thereon. At the close of the year the value of stock on hand in the Southern Circle had decreased from Rs. 1,86,343 to Rs. 1,53,765, and in the Northern Circle had increased from Rs. 60,532 to Rs. 6[illegible]5.

10. *License and Voucher System.*—The revenue from forest produce removed under the license system, including the grazing-tax, which accrues chiefly in the Kistna District, was Rs. 2,64,488 for the Northern and Rs. 2,95,694 for the Southern Circle.

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11. *Financial Results.*—The following statement shows the financial results of the year for each Circle as well as for the whole Presidency :—

—	Northern.	Southern.	Presidency.
	RS.	RS.	RS.
Receipts	3,89,112	5,14,802	9,03,914
Expenditure, Conservancy and Works	1,27,047	1,76,520	3,03,567
Do. Establishments and Contingencies ...	1,24,276	2,08,715	3,32,991
Total Expenditure ...	2,51,323	3,85,235	6,36,558
Surplus ...	1,37,789	1,29,567	2,67,356

	Receipts.	Expenditure.
	RS.	RS.
1877-78 to 1881-82 ...	6,69,978	5,55,263
1881-82 ...	8,05,884	6,03,069
1882-83 ...	9,03,914	6,36,558

The figures compare, as noted in the margin, with the combined totals of the previous year under Forests and Jungle Conservancy and with the average figures for the five years ending 31st March 1882.

12. *Prosecutions.*—Out of 425 cases in the Southern and 364 in the Northern Circle, only 68 in the former and 57 in the latter resulted in acquittals. The convictions numbered 340 and 277 respectively. The Government note that effective steps are being taken to put a stop to the timber-smuggling trade in Kurnool, and that the Tahsildar of Sirvél has shown himself especially energetic in co-operating with the Forest Department for this purpose.

13. In the earlier portion of his report, the Conservator, Northern Circle, deals with various questions, such as the system of audit, the disposal of driftwood, &c., which have not as yet been finally decided, and are therefore irrelevant for the purposes of the report. The Government will be ready to consider all such matters in their proper time and place.

14. In conclusion, the Government have much pleasure in placing on record their satisfaction with the mode in which the department has been administered during the year under review.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Public Works Department.

No. 101A.

Copy to the Government of India, Home Department.

(Signed) H. E. STOKES,
Secretary to Government.

Exd. W. H. French.

100 Copies.

In No 310/84

Govt. of {1884} Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 21st January 1884,
Nos. 101, 101A.

JANUARY.

Forest Administration Reports

for 1882-83.—Passing orders on Board's review of the—.

No 378

[C]ommunicated to the Officers in charge of Settlement Parties, to [th]e Agricultural Reporter and to the Inspector of Cattle Diseases.

[D]ept. of Rev. Sett. & Agre.
[M]adras 19 February 1884

(By order)

[signature]
1st. Assistant

To,
The Dy. Director of Reve: Settt.
Party No III

21st January 1884, No. 112, Revenue.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following letter from J. NUGENT, Esq., Secretary to the Government of Bombay, Revenue Department, to the Secretary to the Government of India, dated Bombay Castle, 23rd November 1883, No. 8586; and endorsement thereon, dated 14th January 1884, Circular No. 5—7A-21 (Famine):—

I am directed to report, for the information of the Government of India, that Lieutenant J. H. Bor, whose services were temporarily placed at the disposal of this Government by the Government of Cyprus in connection with the locust plague, left Bombay on the 9th instant, to rejoin his appointment in Cyprus. Before leaving, Lieutenant Bor submitted a report on the results of the attempt to introduce in this Presidency the system of locust-killing so successfully employed in Cyprus, and I am to enclose a copy of it for the information of His Excellency the Governor-General in Council, and at the same time to observe that this Government have been well satisfied with the intelligence and assiduity displayed by that officer whilst employed in Bombay, although after a fair trial it appeared that the Cyprus system of locust-killing could not be successfully applied in the Bombay Presidency.

Enclosure.

Letter from Lieutenant J. H. BOR, on special duty, to the Secretary to the Government of Bombay, Revenue Department, dated Bombay, 6th November 1883.

Government having sanctioned, by Resolution No. 7652 of 1883, my departure from Bombay on the 9th instant *en route* for Cyprus, I have now the honor to submit the following brief report of the result of the attempt to use in this Presidency the same method for destroying locusts which has been so successfully employed in Cyprus for the last two years. I also add a few remarks about the locusts generally, and the method for their destruction which seems to me most likely to meet with success, should the Presidency be again inflicted with the pest from which it has apparently been saved this year by the unusually heavy fall of rain.

2. In my report, dated the 23rd April last, I recommended that two hundred screens, similar to those used in Cyprus, should be constructed and tried experimentally on the young locusts which were expected to appear about the 1st August. This was approved of by Government, and by the end of June the screens had been manufactured in the Thána and Yerrowda jails and been distributed in the Collectorates of Sátára, Poona, Ahmednágar, Khándesh, Násik, Thána, Kolába and Ratnágiri, ready for trial. Parties of police from each of those Collectorates were instructed by me in the use of the screens.

3. It was thought that the old locusts, which infested the ghâts from January to May of this year, might possibly migrate beyond the limits of the Presidency before the breeding season came on; to a small extent this did happen: towards the end of May, as the monsoon approached, the locusts resting on the ghâts began to make a general movement in a north-easterly direction, and no doubt many of them passed out of the Presidency. At Dhulia, in the first week of June, I saw large flights of locusts high up in the air, almost out of sight, going rapidly in a north-east direction. However, as soon as the monsoon broke, those that remained behind commenced laying their eggs. Efforts were made to collect and destroy the eggs, and though only small quantities were destroyed, yet the attempt was productive of good, inasmuch as it caused the peasantry to become intimately acquainted with the habits and breeding-grounds of the locusts.

4. The first alarm of young locusts came from Sarola in Ahmednágar on the 10th July; then there was a lull till the end of that month, from which time the young insects began to appear at various places in the Collectorates of Sátára, Poona, Ahmednágar, Khándesh, Násik, Thána, Kolába, and Ratnágiri. On the 17th July I visited Sarola, hoping to be able to use the Cyprus screens, but the insects were then too small. On the 1st August I again visited Sarola, but I found that the Cyprus screens were useless, as the insects were too scattered and would not move in any fixed direction. From that date at intervals up to the 1st instant, I have attempted to use the screens in various places, and have seen the conditions of the country as regards locusts and vegetation in Sátára, Poona, Ahmednágar, Násik, Thána, and Kolába. On the 1st instant I saw young locusts that were able to fly near Ambauna in the Poona Collectorate. Having thus seen the young locusts from the time they hatched out till they got their wings, I am able to give a very decided opinion that the screens, as used in Cyprus, are quite inapplicable to the conditions under which the locust is found here and is completely ineffectual in this country. This is an opinion shared by all those who have seen the method tried. The reasons of the failure are chiefly—

1st—the young locusts do not band together and march in swarms, and they cannot be driven;

2nd—the heavy monsoon rain, the wet condition of the ground and the vegetation hinder the screen from working properly: it gets covered with mud which enables the locusts to creep over it, and it cannot well be moved from place to place owing to its wet condition; besides, after a very short time, it would become rotten and would not last more than one season.

It must be remembered that in Cyprus, where the system has been used with so much success, the young locusts band together and march along the ground in compact masses at the rate of from 2 to 3 miles a day; also that in that island, during the period in which the young locusts are found, there is little rain and not much vegetation—a condition of things quite the opposite to what is found here.

5. As regards other methods of destruction, only two seem to have found favor in this Presidency—one is beating with bundles of rods the ground where the young insects are, the other is the bag-net system referred to in Government Resolution No. 6749 of 1883. The former I consider quite useless: at the trials which I witnessed, few of the young insects were killed, the number of laborers is very great, and the plan can only be used where the grass is very short; it could not be used in any crop without entirely destroying the crop. The bag-net system is, I think, the only plan that can be used here with any prospect of success; the first cost of the bag is small; it requires few laborers and little transport, and it can be used in all weathers from the first moment the young locusts are able to hop to the last moment before they are able to fly; it can be used in any crop without causing much damage, and the labor involved is one well suited to the native peasantry.

6. From all I have seen in the various Collectorates, I do not think the country will suffer much from the ravages of locusts this year unless they swarm in from other places. Large numbers of the young locusts which hatched out in August were killed by the heavy rain in September and October; many of the survivors appear to be in an unhealthy condition, a good many of them are suffering from a worm which resembles a guinea-worm, and which kills them. Others are infested with little red parasites, which shows that they are not in a thriving state.

7. During the breeding season I observed that the female failed almost entirely in the production of the fluid which in other countries she usually discharges over the cluster of eggs, and which, when dry and hard, forms a water-proof shell around the cluster of eggs so as effectually to protect them against the damp: in consequence of the absence of this protection, large numbers of the eggs must have rotted away in the ground during the months of June and July last: this is not mere supposition, for in many instances I myself found the eggs in the ground rotted away to a pulp. The failure of this secretion would point to the supposition that there is something either in the climate or in the food here which is unwholesome for the locusts, and I think this alone is sufficient to prevent the locusts ever making a permanent breeding-ground of this Presidency.

Circular No. 5—7A-21 (Famine).

Copy forwarded to the Government of Madras for information.

(By Order.)

Rev. and Agl. Dept.,
Calcutta, 14th January 1884.

(Signed) H. M. KISCH,
Offg. Under Secy. to the Govt. of India.

Order—dated 21st January 1884, No. 112, Revenue.

Miscellaneous.

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture.

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(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
" Director of Revenue Settlement and Agriculture.
" Superintendent, Government Central Museum.

Exd. J. Henricus.

80 Copies.

In No 355/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 21st January 1884, No. 112.

No 397

...municated to the Officers in charge of Settlement Parties, to ...Agricultural Reporter and to the Inspector of Cattle Diseases.

...t. of Rev. Sett. & Agre.
...ras 12 February 1884

(By order)

[signature]
1st. Assistant

...he Dy. Director of Reve. Settl.
Party No III

JANUARY.

Locusts.

Papers from the Government of India regarding the destruction of — in Bombay by the Cyprus system, communicated to certain authorities.

19.2.84

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following letter from H. C. FANSHAWE, Esq., Officiating Junior Secretary to Government, Punjab and its Dependencies, to the Secretary to the Government of India, Revenue and Agricultural Department, dated Lahore, 15th December 1883, No. 413:—

Financial Commissioner's No. 1232 of 15th October 1883, with enclosures.

I am directed by the Lieutenant-Governor to forward, for the information of the Government of India, a copy of the correspondence noted in the margin, containing reports of the exhibitions of silk cocoons which were held in the month of May last at Pathánkot in the Gurdáspur district and at Núrpur in the district of Kángra.

2. In reference to your letter No. 37 F. and S. of 22nd February 1883, I am to say that report on the measures to be taken for the destruction of diseased silk-worms in the districts of Kángra and Gurdáspur (which has not yet been received from the Financial Commissioner) will be submitted hereafter.

ENCLOSURES.

Letter from E. B. FRANCIS, Esq., Junior Secretary to Financial Commissioner, Punjab, to the Junior Secretary to Government, Punjab, dated Lahore, 15th October 1883, No. 1232:—

Commissioner, Amritsar's No. 1514, dated 22nd May, and enclosures.
Commissioner, Jullundur's No. 1836, dated 23rd August, and enclosures.

I am directed by the Officiating Financial Commissioner to forward, in original, the letters noted in the margin, reporting on the exhibitions of silk cocoons held this year at Pathánkot in the Gurdáspur district and at Núrpur in the Kángra district.

2. The exhibitions were held on the 2nd and 5th of May, respectively. The number of exhibitors at Pathánkot was 543, as against 720 last year, and the quantity of cocoons produced was maunds 221-27-12, as against maunds 268-39-0. In the case of Núrpur comparison must be made with the exhibition last held at that place in 1880; and it appears that the number of exhibitors who belonged to the Kángra district considerably exceeded the attendance of that year, being 207 as against 173, besides which 157 exhibitors came to Núrpur from the Gurdáspur district.

The quantity of cocoons brought to the show at Núrpur was, however, very small, being not quite 12 maunds, while in 1880 there were maunds 38-14-0. Taking both meetings together, it will be seen that the number of exhibitors who appeared in the present year is larger than it was at the combined show at Pathánkot last year, but the quantity of produce reported is less than before.

3. The decrease in the outturn is attributed by the Deputy Commissioner of Gurdáspur to the inferior quality of the seed used. The foreign seed supplied to the growers by the firm of Messrs. Lister and Co. was unfortunately mixed by the receivers with their own country seed, which was extensively diseased, and thus the whole stock was spoiled. The Deputy Commissioner of Kángra assigns the prevalence of high and unseasonable winds as an additional cause of the unsatisfactory results at Núrpur. Comparing the weight of the cocoons with that of the seed from which they were produced, it appears that at the Pathánkot exhibition the former was 79 times, and at Núrpur 70 times the latter. The cocoons are specified in the Amritsar report as being fresh or undried, and were no doubt in the same state at Núrpur also. The results are therefore far below the proper standard in both cases. In an experiment made at Chindwára, in the Central Provinces, in the present year, it is reported that ¾ oz. of seed produced 41 lb., 12½ oz. of "green" cocoons, or about 900-fold the weight of the seed used;

and it is stated in works on sericulture that 1 oz. of seed should yield 20 lb. to 23 lb. of dry cocoons, equivalent to about three times the same weight of cocoons in the "green" state. These figures show how much room for improvement there still is in the practice of silk-worm rearing in the Punjab.

4. The Officiating Financial Commissioner regrets to learn that Messrs. Lister and Co., being disappointed in their expectation of obtaining the supplies of cocoons which they require from the native rearers, have found themselves obliged to discontinue the very liberal support which they have hitherto extended to these producers. He hopes that the local officers and their committees may in time succeed in inducing the people to practise more care and attention in the management of their worms. Captain Bartlett, proprietor of the Punar Tea Estate, has furnished the Deputy Commissioner of Kángra with a useful memorandum on this subject, of which Colonel Jenkins intends to avail himself for the instruction of the people. At Pathánkot a practical lecture on the same topics was delivered to the persons present by Rái Sánjhi Mal, Extra Assistant Commissioner, and his recommendations were enforced by Colonel Harcourt personally. The reports show that the silk industry has the best attention of the officers of Government in both districts, and Colonel Davies trusts that next year they may be able to report greater progress.

5. The sum distributed in prizes was Rs. 953 at Pathánkot and Rs. 785 at Núrpur. The money was provided from Municipal and District Funds. The proposal of the Deputy Commissioner of Kángra to take the quantity of the produce obtained into consideration, as well as its quality, in awarding prizes, is one which it appears to be very advisable to adopt.

6. With regard to the question of the place best suited for holding these exhibitions, I am to state that, in accordance with your letter No. 200 of the 16th July, the Commissioners of Amritsar and Jullundur were asked for their opinions, and their replies, as noted in the margin, are forwarded, in original, for the information of Government. Colonel Davies, for the reasons stated by him in the letter, No. 711 of 29th March last, written by him as Commissioner of Jullundur, considers that for the present it would be best to adhere to the plan of having separate exhibitions at Núrpur and Pathánkot; another year's experience is, he thinks, necessary to show whether there are sufficient reasons for preferring a single joint exhibition in either of the two districts. If this be eventually decided on, he is of opinion that it should be held at Pathánkot.

Commissioner, Amritsar's No. 2510, dated 3rd September.
Commissioner, Jullundur's No. 1867, dated 28th August.

Letter from Colonel C. A. McMAHON, Commissioner and Superintendent, Amritsar Division, to the Junior Secretary to Financial Commissioner, Punjab, dated 22nd May 1883, No. 1514:—

I have the honor to forward, for the information of the Financial Commissioner, a copy of a letter No. 25 of the 18th instant, and of its enclosures, containing a report by the Deputy Commissioner of Gurdáspur on the annual exhibition of silk cocoons held at Pathánkot on the 2nd idem.

2. As compared with the exhibition held in 1882, there was a considerable decrease this year in the number of exhibitors and also in the quantity of the exhibits. The Deputy Commissioner states that the decrease in the number of cultivators who sent exhibits is attributed to two reasons :—

1st.—That the winter crops were exceptionally good, and that the cultivators neglected the silk industry in consequence.

2nd.—That the people would not go to the trouble and expense of procuring foreign seed, and the country seed was so inferior that it was hopeless to expect anything from it. The Deputy Commissioner is of opinion that the latter is more probably the correct reason.

The decrease in the quality of the exhibits is said to be "owing to the inefficient quantity (quality ?) of the seed."

3. It is a matter for regret that the natives, to whom Messrs. Lister and Co. distributed seed, were not alive to the advantages offered them, but spoilt what they had received by mixing it with diseased country seed. The consequence is that the firm has discontinued offering prizes for the exhibition, and has determined to raise cocoons for itself instead of relying on the native cultivators.

4. The Deputy Commissioner's report says nothing in regard to the *quality* of the exhibits; but probably, like last year, the cocoons were not of a very good quality owing to the fact that the seed issued by Messrs. Lister and Co. was mixed with the country seed. This was the cause alleged last year for the inferior quality of cocoons exhibited. It is also to be presumed that the health of the worms was much the same as last year, consequent on the mixing of the seed.

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5. Pathánkot is in every way more suited for these exhibitions than Mádhopur, and it is to be hoped that when the people find that this is the case, a larger number will bring their exhibits. It is also to be hoped that attention will be paid to the very important advice given to those present on the last occasion by Colonel Harcourt and Rái Sánjhi Mal, Extra Assistant Commissioner, and that the quality of the exhibits will improve from year to year as the people begin to understand what is necessary for the successful rearing of silk-worms.

6. I agree with Colonel Harcourt that thanks are due to Rái Sánjhi Mal and the other judges, and especially to Mr. Falls, for the manner in which they performed their duties.

7. In conclusion, I would remark that on the whole I do not think the results of the exhibition were as satisfactory as could be desired; but I have every hope that matters will improve when the native cultivators have gained more experience.

Letter from Colonel A. HARCOURT, Deputy Commissioner, Gurdáspur, to the Commissioner and Superintendent, Amritsar Division, dated 18th May 1883, No. 25.

I have the honor to report that the annual exhibition of silk cocoons was held on 2nd May 1883 at Pathánkot in the school-house. Last year the exhibition took place at Mádhopur, but there were many disadvantages in having the gathering there, as Mádhopur has no sarai or shelter for the people, and can neither boast of a bazár, so that those attending were compelled to encamp under the trees, and in the event of a storm coming on were put to much inconvenience. Unquestionably Pathánkot is the best locality in the district for this exhibition, for in the latter place there is a commodious sarai and zailghar; and the town being a fairly large one, supplies are always abundant.

2. We were disappointed in two of our usual contributors to the prize fund. The Deputy Commissioner of Kángra preferred to have a separate district exhibition at Núrpur, which took place three or four days after the one now reported on, and consequently could spare nothing for our show; and Messrs. Lister and Co. also declined to contribute. The firm had been very liberal in giving gratis seed and in awarding prizes, their object being to assist the people in cottage cultivation, not desiring, in the first instance, to raise cocoons themselves. But they found to their regret that the good seed thus distributed was mixed with the diseased country seed, and that little was gained by their liberality; the natives of the district being ready to accept whatever was offered them, but in no way making an adequate return. The firm therefore have decided that no dependence whatever can be placed on native rearing, and they have determined to buy land and build sheds and raise cocoons for themselves. All this costs money, and much increased expenditure must be incurred; and the firm saw no object in adding anything to the prize fund, they having already been put to heavy costs, with as yet a very inadequate return. It is not to be supposed that any firm, even one so wealthy as that of Messrs. Lister and Co., would, as they have done, give gratis seed and medals—very handsome, substantial medals these are too—without expecting a *quid pro quo*. They naturally hoped that their efforts would be met half way, and being disappointed in this expectation, they prefer now to adopt a different plan of procedure, and having distributed gratis over 1,400 oz. of eggs this year, worth some Rs. 7,000, they consider it would be a work of superfluity to give money in prizes.

3. The District Committee of Gurdáspur gave Rs. 1,000 in prizes, and the cocoons were laid out in the school-house, a very large concourse of people having assembled, and it was clear there was a good deal of general interest taken in the proceedings. The Prize Committee consisted of Rái Sánjhi Mal, Extra Assistant Commissioner, and Mr. Falls, of Messrs. Lister and Co.'s firm, and these gentlemen, aided by the Tahsíldárs of Gurdáspur, Pathánkot, and Shakargarh, who were all in attendance, did their work very well and thoroughly. I had arranged that all the cocoons for exhibition were to be in the school-house on the day before the show, and this caused a great saving of time, as heretofore; even while the Prize Committee was at work, fresh supplies of cocoons would be brought in causing great delays and inconveniences in the judging.

4. At 5 P.M. I went down to the place where the prizes were to be distributed, and there, in the presence of a considerable crowd of natives and of some European visitors, rewards were distributed.

5. Especial thanks are due to the judges; they had a hard time, for it was an exceptionally hot, hurried day, and the heat even at 5 P.M. was most trying. But these gentlemen began work early, and did not end their labors till everything had been satisfactorily arranged. Rái Sánjhi Mal has had a good deal to do with silk industry, and his assistance and aid in all the proceedings deserves very cordial acknowledgment. Mr. Falls is not a Government servant, and I am much indebted to him for all the trouble he undertook, I am afraid, at some loss and inconvenience to himself.

6. The accompanying table shows the number of exhibitors :—

Detail.		Exhibitors.		Total.
		Cultivators.	Mixed Professions.	
Gurdáspur District	...	94	325	419
Kángra ,,	...	5	117	122
Siálkot ,,	...	...	...	...
Gujrát ,,	...	...	1	1
Lahore ,,	...	...	1	1
Total of 1883	...	99	444	543
Total of 1882	...	206	514	720

7. The decrease in the number of the cultivators is put down to two reasons. The first reason assigned is that the winter crops were exceptionally good and that the cultivators neglected the silk industry in consequence; and the second reason given, which is more probably the correct one, is that the people would not go to the trouble and expense of procuring foreign seed, and their own indigenous seeds were so bad that it was hopeless to expect anything from them.

8. The prizes were awarded on the same principle as ruled last year, agriculturists and mixed traders and professions being separately classed.

The following table shows the result as compared with former years :—

—	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.
Cultivators	98	56	Not stated.	No exhibition.	63	124	206	99
Other professions		108			166	323	514	444
Total ...	98	164	...	...	229	447	720	543

9. I attach also a tabular statement of the number of agriculturists and of other traders or professions, arranged according to their respective tahsíls, with the number of prizes and the amounts awarded :—

Serial Number.	Tahsíl.	Cultivators.	Other Professions.	Number of Prizes.		Amount of Prizes.		Total Amount of Prizes.
				Cultivators.	Other Professions.	Cultivators.	Other Professions.	
						RS.	RS.	RS.
1	Patháńkot	28	195	2	44	14	522	536
2	Shakargarh	52	60	8	6	65	49	114
3	Gurdáspur	14	64	2	15	10	155	165
4	Batála	...	6	...	3	...	15	15
5	Kángra	5	117	3	8	44	69	113
6	Gujrát	...	1	...	1	...	5	5
7	Lahore	...	1	...	1	...	5	5
	Total of 1883 ...	99	444	15	78	133	820	953
	Total of 1882 ..	206	514	27	85	235	1,424	1,659

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10. The undermentioned table gives a detail of fresh silk cocoons produced by agriculturists and mixed classes :—

Year.	Cultivators.		Mixed Professions.		Number of Persons who used Government leaves.	
	Seed.	Produce.	Seed.	Produce.	Cultivators.	Other Professions.
	M. S. C.	M. S. C.	M. S. C.	M. S. C.		
1883	0 13 0	36 23 0	1 19 3 1½ tola.	185 4 12	11	171
1882	0 31 8	65 28 0	2 12 0	203 11 0	251	...

The produce, as stated before, was less than last year's owing to the inefficient quality of the seed; the proportion of foreign to that of country cocoons produced being calculated at 1 maund of foreign to 20 seers 15 chittáks of country cocoons.

11. At the close of the prize giving, Rái Sánjhi Mal read a very practical and sound address to those present. He had shown me this beforehand, and I fully approved of all he had to say, and added a few hints of my own as to what might properly be brought to the notice of his audience. He laid great stress on the rearers taking more care in separating the healthy from the diseased seed, and on the necessity of unceasing care of the silk-worms, both night and day, with the absolute need for securing light and plenty of fresh air and cleanliness in the rooms where the worms were working. I briefly pointed out, after the conclusion of the address, that the industry promised to be a very paying one, and that it was well worth the while of those present to make every effort to secure the profits that would assuredly fall to those who attended to the wise advice the Extra Assistant Commissioner had given them; and announcing that the exhibition would, for the future, always be held in Pathánkot, the meeting broke up.

12. Separate tables giving the list of prizes for foreign and country seed cocoons, with a statement showing the result of the exhibition, are attached.

Table showing the Prizes for foreign seed Cocoons.

—	Prizes for Foreign Silk Cocoons at Gurdaspur.			Prizes for Foreign Silk Cocoons at Kangra.		
	Number of Persons each Class.	Amount of Prize of each Class.	Amount of Prizes given.	Number of Persons each Class.	Amount of Prize of each Class.	Amount of Prizes given.
		Rs.	Rs.		Rs.	Rs.
I	1	75	75	...	...	...
II	1	50	50	...	...	...
III	2	25	50	...	...	...
IV	3	20	60	2	20	40
V	8	15	120	...	...	...
VI	12	10	120	3	10	30
VII	21	5	105	3	5	15
				Gujrát 1	5	5
VIII	3	4	12	2	4	8
Total ...	...	...	592	...	...	98

Table showing Prizes for Classes.	Country Silk Cocoons, Gurdáspur.			Country Silk Cocoons, Kángra.		
I	1	30	30	...	...	...
II	...	...	...	1	20	20
III	2	15	30	...	...	...
IV	10	10	100	...	...	...
V	14	5	70	...	...	...
				Lahore 1	5	5
VI	2	4	8	...	...	...
Total ...	...	...	238	...	...	25
Grand Total ...	...	...	830	...	...	123

(Signed) A. HARCOURT,
Deputy Commissioner.

STATEMENT showing the result of exhibition of Silk Cocoons held at Pathánkot on 2nd May 1883.

Tahsíl.	Cultivators.	Mixed Professions.	Number of Prizes given to		Amount of Prizes.		
			Cultivators.	Mixed Professions.	Cultivators.	Mixed Professions.	Total.
1	2	3	4	5	6	7	8
					RS.	RS.	RS.
Pathánkot	28	195	2	44	14	522	536
Shakargarh	52	60	8	6	65	49	114
Gurdáspur	14	64	2	15	10	155	165
Batála	..	6	..	3	..	15	15
Gujrát	..	1	..	1	..	5	5
Lahore	..	1	..	1	..	5	5
Kángra	5	117	3	8	44	69	113
Total ..	99	444	15	78	133	820	953

Tahsíl.	Weight of Seed used in 1883.		Weight of Cocoons produced in 1883.		Silk produced in 1882.		Number of men using leaves of Government trees.
	Foreign.	Country.	Foreign.	Country.	Foreign.	Country.	
	9	10	11	12	13	14	15
	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	
Pathánkot	0 16 12	0 6 6	69 31 0	32 20 0	..	..	78
Shakargarh	0 6 11	0 7 3	15 39 0	16 16 0	0 2 0	0 7 0	44
Gurdáspur	0 10 15	0 13 14	34 27 8	12 3 0	..	..	56
Batála	0 1 2	0 0 5	1 28 0	0 36 0	..	..	4
Gujrát	..	0 0 8	..	1 0 0	..	..	..
Lahore	..	0 0 1	..	0 15 0	..	..	..
Kángra	0 5 0 3 T.	0 3 5 3½ T.	18 17 12	10 2 8	0 7 0	..	4
Total ..	1 0 8 3 T.	0 31 10 3½ T.	145 15 4	76 12 8	0 9 0	0 7 0	186

(Signed) A. HARCOURT,
Deputy Commissioner.

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Letter from Lieutenant-Colonel G. G. YOUNG, Commissioner and Superintendent, Jullundur Division, to the Junior Secretary to Financial Commissioner, Punjab, dated Jullundur, 23rd August 1883, No. 1836.

I have the honor to forward, for the information of the Financial Commissioner, a letter, No. 823, dated 6th instant, from the Deputy Commissioner of the Kángra district, reporting the result of the late exhibition of silk cocoons held on the 5th May at Núrpur.

2. It will be remembered by the Financial Commissioner that before the year 1881, these local exhibitions were held annually at Núrpur; but that in that year, under orders of Government on the Financial Commissioner's recommendation, it was determined to try whether the industry would not be further stimulated by holding a joint exhibition at Mádhopur for both Kángra and Gurdáspur, and at which it was hoped that exhibitors from Hoshiárpur, Amritsar and Siálkot would also compete.

3. Colonel Davies, the Commissioner, when on tour in this district last cold weather, arrived at the conclusion that the Kángra district rearers of silk cocoons are "very very averse to taking their cocoons to Mádhopur, and that the holding of a combined exhibition is having an injurious effect on the development of the silk industry in the Kángra district." He therefore supported a recommendation of the Deputy Commissioner that for the future he should be allowed to hold his own exhibition, as previously, at Núrpur. This was all reported in this office, No. 711, dated 29th March 1883, and, in anticipation of sanction, the Deputy Commissioner was authorised to arrange for an exhibition, as he proposed, in the month of May.

4. The result, as now reported, is not as I think very satisfactory; for I find in paragraph 4 of Deputy Commissioner's letter that although there were 207 exhibitors from this district, as compared with 173 in the year preceding, the amount of cocoons offered for exhibition was only 11 *maunds* 30 *seers* as compared with 38 *maunds and* 14 *seers* in 1882. Thus the average amount was 2 seers and 2 chittáks per exhibitor compared with 8 seers and 14 chittáks in 1882.

5. For this very small show prizes to the amount of Rs. 635 were given to 77 district exhibitors, and Rs. 150 odd was given to 18 exhibitors from Gurdáspur, total Rs. 785.

6. The falling off in the amount of cocoons offered for exhibition is attributed to the occurrence of disease amongst the worms, caused, it is said, by the intermixture of country and foreign seed and by unfavorable weather. The remarks of Captain Bartleet, offered at Colonel Jenkins' request, and which form one of the enclosures of the Deputy Commissioner's letter, indicate that this disease is probably caused by want of attention to cleanly treatment of the worms and the provision of suitable cover and fodder near the residence of those engaged in the industry.

7. Colonel Jenkins remarks that the cocoons produced showed *no improvement* in quality, and this is doubtless attributable to the absence of care in keeping the imported seed apart from indigenous seed.

8. I am disposed to agree in thinking that in future *some regard* to quantity should be paid in awarding prizes, as well as to quality of the cocoons. Colonel Davies, on a former occasion, expressed the opinion that the amount of the prizes should not be regulated by the amount of the crop; but if the crop gets smaller and smaller and the amount of prizes larger year by year, or remains stationary, it is obvious that the object of the prize-giving will not have been attained; whilst if losses from disease, attributable to want of care and cleanliness, involve the loss of a prize, it is probable that stimulus to greater exertion in the ensuing year will be the result, and this is what is desirable. A few good cocoons should not therefore, I think, entitle to a prize in default of the production of a reasonable quantity of cocoons. I have no experience of the industry myself however, and offer these remarks with some diffidence.

9. The local agent of Messrs. Lister and Co.'s firm, and Captain Bartleet, himself a silk rearer, appear to have rendered valuable assistance to the Deputy Commissioner; and it is satisfactory to hear of the success of the latter gentleman in rearing cocoons on his estate in the valley. The example and instruction afforded by his more careful and intelligent system cannot but be of benefit to his native neighbours. It is however impossible, I think, to adopt his suggestion that the indigenous eggs should be destroyed at present. The memorandum Captain Bartleet has favored us with is interesting and instructive, and I have asked the Deputy Commissioner to thank him for it.

Letter from Colonel C. V. JENKINS, Deputy Commissioner, Kángra, to the Commissioner and Superintendent, Jullundur Division, dated 6th August 1883, No. 823.

I have the honor to submit the following report on the annual exhibition of the silk cocoons held at Núrpur on the 5th of May 1883.

2. The exhibition, which used formerly to be held at Núrpur, was, in 1881, removed to Mádhopur in the first instance, and subsequently to Pathánkot, as an experimental measure and

chiefly for the convenience of the Gurdáspur silk rearers. This measure, however, proved a failure, and was found to be decidedly detrimental to the growth of the silk industry in this district, as, besides the trouble and inconvenience entailed by a long journey, the competitors from this district suffered other disadvantages at the Pathánkot exhibition. These I had the honor of bringing to the notice of Colonel Davies, then Commissioner, and in accordance with the sanction conveyed in his No. 711½ of the 29th March last, arrangements were made for holding the exhibition this year at Núrpur.

3. The 5th of May was fixed upon, and due notice to the silk rearers of this as well as the Gurdáspur district was given that the exhibition would be held this year at Núrpur as formerly.

I proceeded to Núrpur, and was there on the date fixed. Mr. Keighley (of the firm of Messrs. Lister and Co.) and Captain Bartleet (proprietor of the Punnar tea estate) were present, as also Messrs. Dodgson and Murray, tea planters in this valley. Mr. Ghose, head master of the District School at Núrpur, Rám Chand, the tahsildar, and Muhammad Ali, late superintendent of my Vernacular office, also assisted me in holding the exhibition.

A sum of Rs. 800 was provided from District and Municipal funds for distribution in prizes and contingent expenses. This was inclusive of a sum of Rs. 300 advanced during the year to deserving growers, and which was recovered before the exhibition took place.

4. Nearly all the exhibitors had come in by the prescribed date, and a few that came in late in the day were also admitted.

The total number of exhibitors present, inclusive of the 157 from Gurdáspur, was 364, or 207 from this district, against 173 in the preceding year. The quantity of cocoons produced was 11 maunds 30 seers as compared with 38 maunds 14 seers. The number of exhibitors rewarded was 77 as against 44, and the amount of prizes 635 and 575, respectively. Eighteen exhibitors from Gurdáspur received prizes aggregating Rs. 150. It will be seen, therefore, that the total number of successful competitors was 95, and the aggregate amount of prizes awarded to them Rs. 785; the balance of the money provided went towards defraying the other expenses of the exhibition.

5. There was a remarkable falling off in the amount of outturn, which is attributed to the occurrence of disease amongst the worms, caused, it is believed, by the intermixture of country and foreign seed and the prevalance of high and unseasonable winds.

The estimated loss owing to these causes, according to the tahsildar's calculation, was 68 maunds.

There was no appreciable improvement in the quality of cocoons produced, which, I think, might also be ascribed to the unfavorable causes enumerated above.

6. The prizes have hitherto been awarded on the principle of quality alone; but as there can be no doubt that quantity should be taken into consideration in adjudging merit as well as quality, it is intended that from next year the distribution of prizes may be regulated accordingly, with a view to stimulating a more healthy competition and preventing fraudulent practices on the part of exhibitors.

This has been explained before, the danger being that, unless this plan be adopted, and a check register kept of the produce of each competitor, any one such person competing might distribute his produce to others who will get reward for quality not of their own production.

7. I have much pleasure in appending to this report a letter from Captain Bartleet, proprietor of the Punnar tea estate, who accompanied me to the exhibition and who has already attained successful results in the experiments in sericulture which he is conducting on methodic principles. Captain Bartleet is setting an example to the native silk rearers, and I shall avail myself of some of his practical suggestions for the instruction and benefit of the rearers who are not (naturally) so advantageously circumstanced as himself.

I also beg to attach for reference a report from the tahsildar of Núrpur on the exhibition under report.

Report of Munshi RAM CHAND, Tahsildar of Núrpur, on the annual exhibition of silk cocoons held at Núrpur on the 5th May 1883.

In accordance with sanction given by the Commissioner in anticipation of the approval of Government, the annual exhibition of silk cocoons, which had experimentally been held at Pathánkot in the Gurdáspur district for the past two years, was arranged for to take place at Núrpur as previously, as the experiment had proved a failure and the removal was found detrimental to the development of the industry in this district. Due notice of the change was given, and by the date fixed all the exhibitors had come in. Rs. 700 was provided for the expenses of the exhibition by contributions from District and Municipal funds. This grant was supplemented by a further allotment of Rs. 100 for exhibitors from Kotla and Tiloknath, who arrived after the distribution of the original grant had been arranged for.

Rs. 300 out of this sum had been advanced under security to the silk rearers of Núrpur on condition of repayment by the date of the exhibition. It was intended to regulate the awards with due regard to the quantity as well as the quality of the exhibits, but this was the first time that the intention was notified; and as it did not seem to have been fully appreciated by the people, it was thought advisable to give effect to the principle from the next year.

On the day fixed all the exhibits brought forward were arranged in the school-room with separate series of labels for the two districts (Kángra and Gurdáspur).

The following gentlemen and officers had been appointed judges of the merits of the various exhibits, viz., Mr. Keighley, agent to Messrs. Lister and Co.; Captain Bartleet, proprietor, Punnar tea estate; Munshi Muhammad Ali, superintendent, Deputy Commissioner's Vernacular office; Mr. Ghose, head master, District School; Munshi Rám Chand, tahsildar of Núrpur.

The following denominations of prizes were proposed :—

	RS.
1st prize	30 each.
2nd "	20 "
3rd "	15 "
4th "	10 "
5th "	5 "

As there were no means of judging of the merits from the quantity point of view, the awards were made in consideration of the quality as exclusive of quantity.

The total number of exhibitors was 364, viz. :—

Núrpur	163
Kángra	40
Nádaun	4
Gurdáspur district	157
Total ...	364

Rewards were adjudged and distributed by the Deputy Commissioner as chairman to the following number of exhibitors :—

Place.	1st Prize, Rs. 30.		2nd Prize, Rs. 20.		3rd Prize, Rs. 15.		4th Prize, Rs. 10.		5th Prize, Rs. 5.		Total.	
	Number of exhibits.	Amount of prize.	Number of exhibits.	Amount of prize.	Number of exhibits.	Amount of prize.	Number of exhibits.	Amount of prize.	Number of exhibits.	Amount of prize.	Exhibits.	Prize.
		RS.		RS.		RS.		RS.		RS.		RS.
Núrpur	1	30	3	60	5	75	16	160	40	200	65	525
Kángra	..	..	..	..	1	15	5	50	3	15	9	80
Nádaun	..	..	..	..	..	..	3	30	..	..	3	30
Gurdáspur	..	..	1	20	2	30	5	50	10	50	18	150
										Total ..	95	785

The balance of Rs. 15 was expended as follows :—

Rs. 5 to Muhammad Sádik Ba[illegible], member, Municipal Committee, for promoting sericulture operations at Núrpur.
Rs. 8 to the tahsil officials for assistance in the holding of the exhibition.
Rs. 2, miscellaneous expenses.

The following comparative table shows the seed used and the produce obtained during the year :—

Seed used.		Estimated Outturn.		Actual Outturn.				Total Outturn.		Loss according to estimate.
				European.		Country.				
Foreign.	Country.	Foreign.	Country.	Disposed of.	Exhibited.	Disposed of.	Exhibited.	Foreign.	Country.	
S. C.	S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.
4 10	2 $\frac{1}{5}$	55 4 12	24 30 3	2 33 10	2 20 1	5 15 5	1 1 10	5 13 11	6 16 5	68 4 5. Unseasonable winds and neglect.

Letter from Captain BARTLEET, to the Deputy Commissioner, Kángra, dated 21st May 1883.

As you expressed a sort of wish while at Núrpur, when I was so kindly invited and hospitably entertained by you that I should give you my impressions on a few points of interest regarding sericulture, both at my place and during the late exhibition at Núrpur and Pathánkot, where I was also present and the guest of Colonel Harcourt, I venture to put what has come under my own notice on paper, in the hope that it may be of some use in encouraging the industry in this district.

There is no doubt that, if properly-constructed rearing sheds are built and care taken by means of chicks, &c., to keep out animals, flies, dust, and excessive heat, the silk-worm will thrive throughout the Kángra district.

I have tried the experiment myself, as you are aware, this year, and find that, at an altitude of about 3,000 feet above sea level, and where the thermometer in-doors does not reach 70 degrees of heat as a rule till the end of March, I could produce 50 lb. of cocoons to the ounce of Japan eggs, and thereby beating Messrs. Lister and Co.'s sheds at Mádhopur and there abouts by no less than 10 lb. to the ounce. This I was able to do, too, though suffering under the great disadvantage of having to send, at the most critical time of the rearing, as far as 13 miles for my mulberry leaf, and I have no doubt but that I could have produced as much as 75 lb. to the ounce if I had had the leaf at my own door and also at one-quarter of the expense.

The fact, therefore, is established that silk-worms will thrive and give a good outturn of good cocoons in this part of the district, for I won a 3rd prize at the Núrpur exhibition, and that, notwithstanding the climate up here being so much colder than Núrpur and lower down, I had only about 20 lb. of my first cocoons to pick from, while others had nearly as many maunds. I may mention that since my return, I have been able to pick a large number of cocoons twice as good which I intend exhibiting at the Calcutta exhibition in October.

It struck me while at Pathánkot and also at Núrpur, where the tahsildar requested me to act as one of the judges, that the natives were very keen about their cocoons winning prizes, and that each man, woman and child thought theirs the best. This was only natural enough, but at the same time shows the utility of the exhibition in this district (and the natives seemed very much pleased to have got back their own exhibition to their own head-quarters of the industry), inasmuch as it creates a good competition in rearing a good class of worm. This, in my humble opinion, can only be done by great care and attention to the following rules :—

1st. Cleanliness and proper rearing sheds.
2nd. Breeding good eggs.
3rd. Cultivation of the mulberry near to the rearing shed.

No. 1. The natives rear their worms in their own houses where flies, animals and often much dirt abound. This is fatal, as the worm is a most delicate creature, and not only objects to, but dies in foul air of any sort. Some few have sheds, but they use these same sheds for cattle, when the crop is over and, as a rule, the cattle are tied up outside when the worms are in the shed and attract all the flies in the neighbourhood, and if there is a diseased worm amongst the lot, the disease is spread in all directions.

No. 2. There can be no doubt that the worm which the native rearer is most fond of, viz., the Dessi (which gives a large and showy, but not a heavy and firm, cocoon like the Japan which weighs two of it), is very much diseased. All silk-worm diseases are, I believe, more or less infectious, and until that disease is eradicated, all description of worms will become diseased too. Mr. Keighley of Messrs. Lister and Co.'s Filature, Mádhopur, whom we met at Núrpur, and who was also one of the judges, has for several years at great expense and trouble distributed gratis thousands of ounces of fresh Japan eggs. The natives have mixed and reared these eggs with the country Dessi worm, and the consequence is that the crops of

both have comparatively failed again and again. The country also is diseased for miles round where the Dessi exists.

Now, I had the same Japan eggs from Mr. Keighley and raised them separately this year. My worms did not die, nor were they diseased, and the way I account for the failure to obtain the perfection in my outturn is simply the want of leaf near enough to my shed.

I will venture to suggest one remedy for this disease, and that is, that the natives should not be encouraged to breed the Dessi, but rather that every egg should, if possible, be destroyed and good eggs supplied to them on payment. I say payment because the native mind looks better after a bought, than a gift, article. If encouragement be given to European gentlemen, and they succeed as I have done, the native will not be long in trying to beat them, and when once he finds out the good result of the destruction of his diseased worms, he will be more careful to keep disease from the good ones he has got in their stead, and the industry will flourish in proportion.

No. 3. The climate and soil all over the district are admirably adapted for the cultivation of the mulberry either as a bush, in a hedge, or as a tree, and of every description of it. It is essential to the welfare of the growing worm that it be fed as often as it wants to eat and then with clean fresh leaves, and therefore leaf at one's own door, so to speak, is a *sine quâ non* of complete success, for withered leaf is deleterious.

The propagation of the Phillippine, the large soft leaved China, and other descriptions of the mulberry which grow freely from cuttings and give leaf earliest in the spring, should be encouraged. Too much can never be grown, as it takes about 2,000 lb. of leaf to rear one ounce of from 38 to 40,000 eggs, which, under the most favorable circumstances, have been known to produce from 80 to 100 lb. of green cocoons, if not more.

I venture to suggest that, if possible, prizes should be given to those who rear and breed cleanly, in proper places, with undiseased worms, and grow mulberry round their own sheds, and that penalties be imposed on those who wilfully retard the industry by breeding and trying to rear diseased worms, if such a thing be possible.

In conclusion, I beg to offer you all the assistance in my power in the promotion of this industry between this and next year's exhibition, some days in advance of which I would be prepared to inspect sheds and make all arrangements in connection with your officials for a careful adjustment of the prizes. At the same time, I have no hesitation in saying that I intend to compete myself and hope that my doing so will not discourage, but encourage, the natives to improve themselves and save their own laurels.

Since the commencement of my first crops of worms in my new shed, I have encouraged the natives of all degrees to inspect my arrangements, and I venture to hope that what they have seen and learnt from me will not be to the detriment of sericulture.

Letter from Lieutenant-Colonel G. G. YOUNG, Commissioner and Superintendent, Jullundur Division, to the Junior Secretary to Financial Commissioner, Punjab, dated Jullundur, 28th August 1883, No. 1867.

In reply to your No. 7113, dated 8th instant, requesting that the question of the locality where an exhibition of silk cocoons should be held may be fully discussed in my report on the exhibition of silk cocoons of the division for the past year, I have the honor to point out that I made my report on or prior to receipt of your letter. The question of the best locality for the fair is one, however, regarding which I fully agree that some settled understanding is highly desirable which will afford a prospect of permanency.

2. I am hardly in a position at this moment to give an opinion as to the views expressed last year by Colonel Davies that the prospects of the industry are being injured by the dislike of the people to take their cocoons out of the district for exhibition, as I have had no opportunity yet for gauging native opinion in the matter, but this is of the less importance, as Colonel Davies will himself have the opportunity of expressing his views as Financial Commissioner.

3. From a district point of view the prospect to hold the joint exhibition at Núrpur is no doubt what will be regarded as desirable; but apart from the objection noticed by Colonel Davies last year, I would be disposed to advocate the claims of Mádhopur as affording greater facilities for exhibiting the produce, as giving the exhibitors the opportunity of seeing the works of Messrs. Lister and Co., and as likely to bring them into freer contact with merchants from Amritsar and other places interested in the trade.

Letter from Colonel C. A. McMAHON, Commissioner and Superintendent, Amritsar Division, to the Junior Secretary to Financial Commissioner, Punjab, dated 3rd September 1883, No. 2510.

I have the honor to acknowledge the receipt of your endorsement, No. 7112, of the 8th ultimo, calling upon me, when submitting reports on the exhibitions of silk cocoons in this division, to discuss fully the question of the locality where such exhibitions should be held.

2. In my letter, No. 1514, of the 22nd May last, I reported on the exhibition of cocoons held at Pathánkot on the 2nd of that month; and as another report will not be due until May or June next year, I think it advisable to reply at once to your endorsement above quoted.

3. In paragraph 5 of my report on the last exhibition, I remarked that "Pathánkot was in every way more suited for these exhibitions than Mádhopur." This disposes of the first three alternative courses proposed by Government letter, No. 200, of the 16th July last, to your address; that is to say, as far as this division is concerned. Pathánkot is, in my opinion and also in that of the Deputy Commissioner, the best locality for these exhibitions.

4. It is, however, more difficult to decide (1) whether it would be advisable to hold a joint exhibition at Pathánkot, or (2) a joint exhibition at Núrpur. The Deputy Commissioner of Gurdáspur is of opinion that a joint exhibition at Pathánkot would be a success; but the Deputy Commissioner of Kángra will probably be of the same opinion in regard to Núrpur. As I do not know the results of the last exhibition held at Núrpur and cannot compare them with those of the Pathánkot exhibition, I am at a disadvantage in offering an opinion regarding the respective merits of the two places.

5. As far as I am in a position to judge, however, I think the preference should be given to Pathánkot for two reasons—

1st. Pathánkot is on the Amritsar and Pathánkot railway, which will be opened in a few months, and it will therefore be more convenient for persons connected with the silk trade at Amritsar and other silk marts attending the exhibition.

2nd. It is nearer Messrs. Lister and Co.'s silk manufactory at Mádhopur than Núrpur would be; and, as Messrs. Lister and Co. are greatly interested in the extension of indigenous silk culture and have spent considerable sums on it in the gratuitous distribution of seed and prizes, I think they should be considered.

Circular No. 6—5-1 (Fibres and Silk).

Copy forwarded to the Government of Madras for information, in continuation of the endorsement from this Department, No. 54—222-31 (Fibres and Silk), of the 4th October 1882.

(By Order.)

REV. AND AGRI. DEPT., CALCUTTA, 17th January 1884.

(Signed) H. M. KISCH, Offg. Under Secy. to the Govt. of India.

ORDER—dated 28th January 1884, No. 131, Revenue.

Miscellaneous.

Communicated to the Board of Revenue, the Director of Revenue Settlement and Agriculture, and the Superintendent, Government Central Museum, in continuation of G.O., dated 19th October 1882, No. 1148.

(True Extract.)

(Signed) H. E. STOKES,
Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture, with copy of G.O., No. 1148 of 1882.
,, the Superintendent, Government Central Museum.
,, Dr. J. Shortt, Yercaud.
,, H. R. Grimes, Esq., Superintendent, Central Jail, Coimbatore.

Exd. J. Henricus.

80 Copies.

In. No 390/84

Govt. of (1884) Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 28th January 1884, No. 131.

JANUARY.

No. 413

Communicated to the Officers in charge of Settlement Parties, to the Agricultural Reporter and to the Inspector of Cattle Diseases.

Dept. of Rev. Sett. & Agre.
Madras 14 February 1884

(By order)

Sleaggwah
1st. Assistant

To
The Dy. Director of Reve: Settt.
Party No. III

Silk Cocoons.

Reports on the exhibition of — held at Páthankot and Núrpur, Punjab, communicated to certain authorities.

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GOVERNMENT OF MADRAS.

IMATE OF THE IMPERIAL REVENUE FROM IRRIGATION WORKS IN THE MADR
ESIDENCY FOR THE YEAR FROM THE 1ST APRIL 1884 TO 31ST MARCH 1885.

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Realis... 18...
1	2	3	4	
	Rs.	Rs.	R	
G. REVENUE FROM PRODUCTIVE PUBLIC WORKS.				
XXVIII. IRRIGATION AND NAVIGATION (DIRECT RECEIPTS).				
Godávari Delta System	79,000	94,500		
Kistna Delta System	50,200	49,800		
Pennér Anicut System	200	26		
Cauvery Delta System	8,000	8.		
Srívaikuntham Anicut System	2,000	[illegible]		
Kurnool Canal	10,000	5,000		

GOVERNMENT OF MADRAS.

BUDGET ESTIMATE OF THE PORTION OF LAND REVENUE DUE TO IRRIGATION U... PRODUCTIVE PUBLIC WORKS.

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Realisations, 1882-83.
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
...NUE FROM PRODUCTIVE PUBLIC WORKS.				
...RTION OF LAND REVENUE DUE TO IRRIGATION.				
...a—				
... Revenue	16,20,000	16,20,000	17,22,000	15,56,401
...venue due to old Irrigation	1,30,000	1,30,000	1,30,000	1,25,184
... to the System	14,90,000	14,90,000	15,92,000	14,31,217
...anced Land Revenue	1,50,000	1,50,000	1,60,000	1,51,165
Total ...	16,40,000	16,40,000	17,52,000	15,82,382
...on Charges in the Civil Department at 7·2 per ...ue	1,18,080	1,18,080	1,26,144	1,13,931
Net Revenue ...	15,21,920	15,21,920	16,25,856	14,68,451
Kistna Delta System—				
Irrigation Revenue	9,00,000	9,00,000	9,75,000	8,29,896
Deduct Revenue due to old Irrigation	76,000	76,000	76,000	75,102
Revenue due to the System	8,24,000	8,24,000	8,99,000	7,54,794
Share of enhanced Land Revenue	1,30,000	1,30,000	1,30,000	1,26,247
Total ...	9,54,000	9,54,000	10,29,000	8,81,041
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	68,688	68,688	74,088	63,435
Net Revenue ...	8,85,312	8,85,312	9,54,912	8,17,606
Pennér Anicut—				
Irrigation Revenue	2,30,000	2,30,000	2,30,000	2,34,957
Deduct Revenue due to old Irrigation	1,20,000	1,20,000	1,13,000	1,20,350
Revenue due to the System	1,10,000	1,10,000	1,17,000	1,14,607
Share of enhanced Land Revenue	15,000	15,000	15,500	15,210
Total ...	1,25,000	1,25,000	1,32,500	1,29,817
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	9,000	9,000	9,540	9,347
Net Revenue ...	1,16,000	1,16,000	1,22,960	1,20,470
Cauvery Delta—				
Irrigation Revenue	29,00,000	29,00,000	31,08,000	29,04,846
Deduct Revenue due to old Irrigation	23,40,000	23,40,000	23,25,000	23,43,214
Revenue due to the System	5,60,000	5,60,000	7,83,000	5,61,632
Share of enhanced Land Revenue	1,36,000	1,36,000	1,36,000	1,36,508
Total ...	6,96,000	6,96,000	9,19,000	6,98,140
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	50,112	50,112	66,168	50,266
Net Revenue ...	6,45,888	6,45,888	8,52,832	6,47,874

GOVERNMENT OF MADRAS.

ESTIMATE OF THE PORTION OF LAND REVENUE DUE TO IRRIGATION UNDER PRODUCTIVE PUBLIC WORKS—*continued.*

—	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Realisations, 1882-83.
1	2	3	4	[illegible]
	Rs.	Rs.	Rs[illegible]	[illegible]
.... REVENUE FROM PRODUCTIVE PUBLIC WORKS—continued.				
...XXX. PORTION OF LAND REVENUE DUE TO IRRIGATION—continued.				
...ivaikuntham Anicut—				
Irrigation Revenue	1,70,000	1,70,000	1[illegible]	[illegible]
Deduct Revenue due to old Irrigation	78,000	78,000	[illegible]	[illegible]
Revenue due to the System	92,000	92,000	[illegible]	[illegible]
Share of enhanced Land Revenue	2,000	2,000	[illegible]	[illegible]
Total ...	94,000	94,000	[illegible]	[illegible]
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	6,768	6,76[illegible]	[illegible]	[illegible]
Net Revenue ...	87,232	87,2[illegible]	[illegible]	[illegible]
...urnool Canal—				
Irrigation Revenue	70,000	57,000	85,000	...
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	5,040	4,104	6,120	...
Net Revenue ...	64,960	52,896	78,880	...
...otal—				
Irrigation Revenue	58,90,000	58,77,000	62,90,000	56,97,841
Deduct Revenue due to old Irrigation	27,44,000	27,44,000	27,41,500	27,41,492
Revenue due to the System	31,46,000	31,33,000	35,48,500	29,56,349
Share of enhanced Land Revenue	4,33,000	4,33,000	4,43,500	4,31,378
Total ...	35,79,000	35,66,000	39,92,000	33,87,727
Deduct Collection Charges in the Civil Department at 7·2 per cent. on Revenue	2,57,688	2,56,752	2,87,424	2,43,916
Net Revenue ...	33,21,312	33,09,248	37,04,576	31,43,81[illegible]

GOVERNMENT OF MADRAS.

ABSTRACT BUDGET ESTIMATE OF THE CHARGES FOR IRRIGATION WORKS IN THE MA PRESIDENCY FROM 1ST APRIL 1884 TO 31ST MARCH 1885.

—	Reference to detailed Estimates.	Budget Estimate, 1884-85.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Outlay, 1882-83.
1	2	3	4	5	6
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.	Page.	Rs.	Rs.	Rs.	Rs.
54. IRRIGATION AND NAVIGATION.					
I.—Works		16,06,162	12,38,275	11,81,693	7,49,287
Establishment		3,34,718	2,59,715	2,50,621	1,64,510
...ls and Plant		39,120	1,20,762	67,686	78,237
...ts on Capital Account		...	...	...	— 1,088
Total ...		19,80,000	16,18,752	15,00,000	9,90,946
...urchase money)		...	1,71,550	1,60,000	1,76,25,050
Total ...		19,80,000	17,90,302	16,60,000	1,86,15,996
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.					
39. IRRIGATION AND NAVIGATION (WORKING EXPENSES).					
I-A.—Extensions and Improvements		1,16,564	1,57,558	1,08,620	65,465
I-B.—Maintenance and Repairs		4,17,298	4,21,881	5,22,000	3,44,604
II.—Establishment		3,12,898	3,14,220	2,68,674	3,08,442
III.—Tools and Plant		60,240	59,706	47,145	58,086
Additional Allotment provisionally allowed to stand pending further consideration		...	...	2,63,161	...
Refunds of Revenue		...	...	...	7,513
Total ...		9,07,000	9,53,365	12,09,600	7,84,110
Totals.					
I.—Works including Extensions and Improvements.		17,22,726	13,95,833	12,90,313	8,14,752
I-B.—Maintenance and Repairs		4,17,298	4,21,881	5,22,000	3,44,604
II.—Establishment		6,47,616	5,73,935	5,19,295	4,72,952
III.—Tools and Plant		99,360	1,80,468	1,14,831	1,36,323
Additional Allotment provisionally allowed to stand pending further consideration		...	...	2,63,161	...
Less Receipts on Capital Account		...	...	...	— 1,088
Refunds of Revenue		...	...	...	7,513
Kurnool Canal (purchase money)		...	1,71,550	1,60,000	1,76,25,050
Total ...		28,87,000	27,43,667	28,69,600	1,94,00,106

LIC WORKS.

GOVERNMENT OF MADRAS.

PART I.

ET ESTIMATE OF EXPENDITURE ON IRRIGATION WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR 1884-85, ARRANGED BY SYSTEMS.

—	Amount of Estimate.	Amount of Actual Outlay to end of 1882-83.	Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Budget Estimate, 1884-85.	Remarks and References.
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.						
54. IRRIGATION AND NAVIGATION.						
Works in Progress.						
odávari Delta System ...	1,10,88,695	92,39,974	3,76,341	3,50,000	4,58,000	Government of of 1882-8 Goverr 1882, 1882
istna Delta System ...	1,38,99,784	58,74,768	4,49,290	4,50,000	5,25,000	Governn of 188 Governm 1882.
angam Anicut System ...	28,96,437	7,57,154	5,31,419	4,64,000	6,08,000	Government of 1881-82.- Government, N 1881.
auvery Delta System ...	16,80,217	10,47,663	1,87,849	2,00,000	2,62,000	Government of Indi of 1883-84.—Procee Government, No. 778 September 1883.
rívaikuntham Anicut System	13,61,520	12,38,078	54,240	36,000	41,500	Government of India Register No. of 1883-84.—Proceedings of Madras Government, No. 863 I., dated 3rd November 1883.
urnool Canal	1,77,96,600	1,76,25,050	1,71,550	1,60,000	...	Proceedings of Madras Government, No. 993 I., dated 5th December 1883.
arur Tank Project	3,20,000	1,00,070	19,613	...	85,500	Government of India Register No 1 of 1883-84.—Proceedings of Madras Government, No. 714 I., dated 3rd September 1883.
Total ...	4,90,43,253	3,58,82,757	17,90,302	16,60,000	19,80,000	
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.						
39. Irrigation and Navigation.						
(Working Expenses.)						
Godávari Delta System ...	...	...	3,42,903	2,85,621	3,58,500	
Kistna do. do. ...	...	...	2,75,513	2,38,220	2,87,600	
Pennér Anicut do. ...	...	...	22,234	31,140	13,800	
Cauvery Delta do. ...	...	...	34,211	1,28,034	7,500	
Srivaikuntham Anicut System	...	...	8,284	22,798	19,600	
Kurnool Canal	...	...	2,70,220	2,40,626	2,20,000	
Additional allotment provisionally allowed to stand pending further consideration.	...	...	...	2,63,161	...	
Total ...	...	...	9,53,365	12,09,600	9,07,000	
Grand Total ...	...	...	27,43,667	28,69,600	28,87,000	

GOVERNMENT OF MADRAS.

PART I—continued.

BUDGET ESTIMATE OF EXPENDITURE IN ENGLAND ON IRRIGATION WORKS IN THE MADRAS PRESIDENCY, FOR THE YEAR 1884-85, ARRANGED BY PROJECTS AND OBJECTS OF WORKS.

——	Budget Estimate, 1884-85.				Revised Estimate, 1883-84.	Budget Estimate, 1883-84.	Actual Outlay, 1882-83.
	Works.	Tools and Plant.	Suspense Account.	Total.			
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
N. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—CAPITAL ACCOUNT.							
54. Irrigation and Navigation.							
ri Delta System	...	...	...	...	19,190	...	...
System	...	...	...	...	13,590	...	...
... ...	...	...	...	...	4,730	...	...
Kurnool Canal	...	...	...	...	1,71,550	1,60,000	1,76,25,050
Total ...	...	...	...	...	2,09,060	1,60,000	1,76,25,050
G. EXPENDITURE ON PRODUCTIVE PUBLIC WORKS—REVENUE ACCOUNT.							
39. Irrigation and Navigation.							
Nil.							

GOVERNMENT OF MADRAS.

PART IV.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT OF THE IRRIGATION BRANCH IN THE MADRAS PRESIDENCY FOR THE YEAR 1884-85.

—	Revised Estimate for 1883-84.	Budget Estimate for 1884-85.	—
	Rs.	Rs.	
Grant for Works and Repairs	18,17,714	21,40,024	
Deduct items on which no charge for Establishment is admissible.			
Land compensation	1,12,047	1,50,865	
Grant for adjustment of the cost of investigating the Barur Tank Project originally charged to Protective Works	35	...	
Cost of completing the Telegraph line along the Kurnool Canal ...	41,100	...	
Total, Deductions ...	1,53,182	1,50,8[illegible]	
Net Grant ...	16,64,532	19,89,1[illegible]	
A. 23 per cent. on the Net Grant	3,82,839	4,57,506	
Direct Revenue	1,59,560	1,49,400	
B. 10 per cent. on Direct Revenue	15,956	14,940	
Indirect Revenue exclusive of the share of enhanced Land Revenue	31,33,000	31,46,000	
Deduct Collection Charges in the Civil Department at 7·2 per cent.	2,25,576	2,26,512	
Net Amount ...	29,07,424	29,19,488	
C. 6 per cent. on the Net Amount	1,74,446	1,75,170	
D. Cost of Establishment employed in investigating the Barur Tank Project	694	...	
Total, A + B + C + D ...	5,73,935	6,47,616	

PART VII.

ABSTRACT OF THE INCREASE OR DECREASE IN THE SUSPENSE ACCOUNTS OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR 1884-85.

None.

All Suspense Accounts are treated as Provincial.

GOVERNMENT OF MADRAS.

APPENDIX A.

ACTUAL AND ESTIMATED CAPITAL ACCOUNT OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1884-85.

	Direct Charges.	Indirect Charges.				Grand Total.
		Capitalization of Abatement of Land Revenue.	Loss by Exchange on Payments in England.	Leave and Pension Allowances.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System.						
Total actual outlay to end of 1882-83 ...	92,39,974	14,27,327	...	3,52,940	17,80,267	1,10,20,241
Probable outlay during 1883-84 ...	3,76,341	29,787	3,198	8,370	41,355	4,17,696
Proposed outlay during 1884-85 ...	4,58,000	25,020	...	11,269	36,289	4,94,289
Total ...	1,00,74,315	14,82,134	3,198	3,72,579	18,57,911	1,19,32,226
Kistna Delta System.						
Total actual outlay to end of 1882-83 ...	58,74,768	2,22,819	...	2,33,041	4,55,860	63,30,628
Probable outlay during 1883-84 ...	4,49,290	30,646	2,265	10,261	43,172	4,92,462
Proposed outlay during 1884-85 ..	5,25,000	33,004	...	12,658	45,662	5,70,662
Total ...	68,49,058	2,86,469	2,265	2,55,960	5,44,694	73,93,752
Pennér Anicut System.						
Total actual outlay to end of 1882-83 ...	14,28,862	1,77,098	...	59,199	2,36,297	16,65,159
Probable outlay during 1883-84 ...	...	...	...	...	...	...
Proposed outlay during 1884-85 ...	...	...	...	...	...	...
Total ...	14,28,862	1,77,098	...	59,199	2,36,297	16,65,159
Sangam Anicut System.						
Total actual outlay to end of 1882-83 ...	7,57,154	26,296	...	18,623	44,919	8,02,073
Probable outlay during 1883-84 ...	5,31,419	29,324	...	11,264	40,588	5,72,007
Proposed outlay during 1884-85 ...	6,08,000	1,00,000	...	13,524	1,13,524	7,21,524
Total ...	18,96,573	1,55,620	...	43,411	1,99,031	20,95,604
Cauvery Delta System.						
Total actual outlay to end of 1882-83 ...	10,47,663	60,760	...	41,815	1,02,575	11,50,238
Probable outlay during 1883-84 ...	1,87,849	25,000	788	4,210	29,998	2,17,847
Proposed outlay during 1884-85 ...	2,62,000	16,250	...	6,408	22,658	2,84,658
Total ...	14,97,512	1,02,010	788	52,433	1,55,231	16,52,743
Srivaikuntham Anicut System.						
Total actual outlay to end of 1882-83 ...	12,38,078	16,177	...	57,880	74,057	13,12,135
Probable outlay during 1883-84 ...	54,240	25,471	...	875	26,346	80,586
Proposed outlay during 1884-85 ...	41,500	14,308	...	780	15,088	56,588
Total ...	13,33,818	55,956	...	59,535	1,15,491	14,49,309
Kurnool Canal.						
Total actual outlay to end of 1882-83 ...	1,76,25,050	...	...	...	...	1,76,25,050
Probable outlay during 1883-84 ...	1,71,550	...	...	...	...	1,71,550
Proposed outlay during 1884-85 ...	...	...	...	...	...	...
Total ...	1,77,96,600	...	...	...	...	1,77,96,600
Barur Tank Project.						
Total actual outlay to end of 1882-83 ...	1,00,070	6,829	...	2,163	8,992	1,09,062
Probable outlay during 1883-84 ...	19,613	...	...	580	580	20,193
Proposed outlay during 1884-85 ...	85,500	...	...	2,222	2,222	87,722
Total ...	2,05,183	6,829	...	4,965	11,794	2,16,977

GOVERNMENT OF MADRAS.

APPENDIX B.

ACTUAL AND ESTIMATED REVENUE ACCOUNT OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1884-85.

—	Probable Receipts, 1884-85.			Probable Expenses during 1883-84 including Indirect Charges.	Balance, Surplus or Deficit for 1884-85.	Probable Net Surplus or Deficit to end of 1882-83.	Actual Net Surplus or Deficit to end of 1882-83.	Probable Net Surplus or Deficit to end of 1884-85.
	Direct Receipts.	Portion of Land Revenue due to Irrigation.	Total.					
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System.	79,000	15,21,920	16,00,920	3,77,500	12,23,420	12,54,848	2,38,30,805	2,63,09,073
Kistna Delta System.	50,200	8,85,312	9,35,512	3,00,232	6,35,280	6,47,200	1,03,73,435	1,16,55,915
Pennér Anicut System.	200	1,16,000	1,16,200	14,840	1,01,360	92,744	12,09,759	14,03,863
Cauvery Delta System.	8,000	6,45,888	6,53,888	11,328	6,42,560	6,15,154	1,40,28,384	1,52,86,098
Srívaikuntham Anicut System.	2,000	87,232	89,232	20,714	68,518	80,132	3,47,082	4,95,732
Kurnool Canal ...	10,000	64,960	74,960	2,26,192	—1,51,232	—2,18,625	— 63,708	—4,33,565
Total ...	1,49,400	33,21,312	34,70,712	9,50,806	25,19,906	24,71,453	4,97,25,757	5,47,17,116

APPENDIX C.

ACTUAL AND ESTIMATED INTEREST ACCOUNT OF THE SYSTEMS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1884-85.

—	Actual Charges for Interest to end of 1882-83.	Probable Charges for Interest for 1883-84.	Probable Charges for Interest for 1884-85.	Total to end of 1884-85.	Net Surplus or Deficit from Appendix B.	Surplus or Deficit after paying Interest to end of 1884-85.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System ...	81,74,910	3,77,126	3,93,813	89,45,849	2,63,09,073	1,73,63,224
Kistna do. do. ...	48,19,225	2,43,977	2,63,462	53,26,664	1,16,55,915	63,29,251
Pennér Anicut do. ...	10,74,532	57,154	57,154	11,88,840	14,03,863	2,15,023
Sangam do. do. ...	25,418	40,915	63,703	1,30,036	...	—1,30,036
Cauvery Delta do. ...	11,60,217	45,664	54,660	12,60,541	1,52,86,098	1,40,25,557
Srívaikuntham Anicut System.	5,92,518	50,608	52,523	6,95,649	4,95,732	— 1,99,917
Kurnool Canal	3,52,501	7,08,433	7,11,864	17,72,798	— 4,33,565	— 22,06,363
Barur Tank Project	...	4,395	6,497	10,892	...	— 10,892
Total ...	1,61,99,321	15,28,272	16,03,676	1,93,31,269	5,47,17,116	3,53,85,847

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GOVERNMENT OF MADRAS.

APPENDIX E.

MEMORANDUM OF WATER AND NAVIGATION RATES IN FORCE IN CANALS OF THE SEVERAL IRRIGATION SYSTEMS IN THE MADRAS PRESIDENCY.

—	Per Acre irrigated.	
	Flow.	Lift.
WATER-RATES.	Rs. A. P.	Rs. A. P.
GODAVARI AND KISTNA DELTA SYSTEMS.		
Single wet crop	4 0 0	3 0 0
Second wet crop on irrigated lands	4 0 0	3 0 0
If compounded for two crops for a term not less than five years	6 8 0	4 14 0
Single dry crop	2 0 0	1 8 0
Second dry crop on irrigated land (if not compounded)	2 0 0	1 8 0
Sugar-cane, betel plantations and other garden produce remaining on the ground for the time of two crops.	8 0 0	6 0 0
Do. if compounded for not less than five years	6 8 0	4 14 0
Dry crop on land for which irrigation has never been supplied or, having been once supplied, has been since discontinued.	2 0 0	1 8 0
KURNOOL CANAL.		
Single wet crop	4 0 0	3 0 0
Second wet crop on irrigated land	3 0 0	2 4 0
If compounded for two crops for a term of not less than five years	6 0 0	4 8 0
Sugar-cane, betel gardens and other garden produce remaining on the ground for the time of two crops	6 0 0	4 8 0
Single dry crop	1 0 0	0 12 0
Second dry crop on irrigated land (if not compounded)	1 0 0	0 12 0
Dry crop on land for which irrigation has never been supplied, or if supplied, discontinued.	1 0 0	0 12 0
Garden crops (Class 2 of Madras Irrigation and Canal Company's rules)	3 0 0	2 4 0

N.B.—A reduction of the above rates at 50 per cent. for the first five years and 25 per cent. for the second five years will be made in the case of lands which have not been wet cultivated within the last ten years.

2. If blocks of 50 acres and upwards of unoccupied waste lands are taken up for irrigated cultivation, water will be supplied, without restriction as to crops, free of charge for five years, and at half rates for another five years.

Water-rates are not separately levied for other irrigation systems.

Navigation Rates on the Godavari, Kistna, Buckingham and Kurnool Canals.

	Rs. A. P.
License Fees—Cargo Boats, per ton of 50 cubic feet	2 8 0
Do. Passenger Boats, A Class do. do.	5 0 0
Do. do. do. B do. do. do.	3 0 0
Do. Budgerows C do. do. do.	5 0 0
Do. do. do. D do. do. do.	3 0 0
Do. Steamers, per ton	5 0 0
Do. Private Boats not carrying goods or passengers per boat per annum ...	12 0 0
Do. Pleasure Boats do. do. do. ...	1 0 0
Tolls—Rafts, timber, per 100 square feet	0 8 0
Do. do. bamboo, do. do.	0 4 0
Do. Cargo and Passenger boats, per ton of 50 cubic feet for six weeks	0 8 0
Steamers do. do.	1 0 0
Private boats not carrying goods or passengers, per boat	3 0 0

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[illegible]

A.

Statement showing the distribution of the grants for Minor Original Works and Repairs under Irrigation and Navigation Works for which neither Capital nor Revenue Accounts are kept.

Divisions.	Revenue due to Imperial Works.	Minor Original Works.		Repairs.	
		Amount applied for.	Proposed grant.	Amount applied for.	Proposed grant.
	RS.	RS.	RS.	RS.	RS.
Ganjam	3,10,629	5,000	5,000	20,000	20,000
Vizagapatam	1,04,496	1,500	1,500	10,000	7,000
Godávari, Eastern	} 1,13,438	{ 10,000	5,000	15,000	7,000
Do. Western...		4,000	2,000	7,000	4,000
Kistna, Eastern	39,871	1,500	1,500	5,000	5,000
Nellore	7,74,137	10,000	10,000	45,000	45,000
Cuddapah	2,79,383	3,000	3,000	25,000	25,000
Kurnool	1,44,022	3,000	2,000	10,000	10,000
Bellary	4,49,442	2,000	1,500	25,000	25,000
Presidency...	7,165	...	...	1,000	1,000
Chingleput	8,75,983	15,000	15,000	60,000	60,000
North Arcot	3,60,668	12,000	6,000	60,000	30,000
South Arcot	10,65,158	15,000	12,000	1,00,000	80,000
Salem	1,63,118	10,000	2,500	30,000	15,000
Coimbatore	4,87,257	7,000	7,000	60,000	40,000
Tanjore	} 1,00,525	{ 2,000	1,000	5,000	3,000
Negapatam		10,000	3,000	5,000	5,000
Madura	2,64,598	10,000	7,000	40,000	30,000
Trichinopoly	4,83,499	4,000	4,000	45,000	40,000
Tinnevelly...	10,33,877	8,000	6,000	70,000	70,000
Total ...	70,57,266	1,33,000	95,000	6,38,000	5,22,000
			35,000	...	28,000
Reserve	...	...	6,436	1,30,766	1,30,766
Old maintenance charges of works for which Capital and Revenue accounts are kept.	...	...		4,00,000	3,70,000
Repairs to minor irrigation works.	...	...	...		
Total ...	...	...	1,36,436	...	10,50,766

B

STATEMENT showing the distribution of the grants for Minor Original Works and Repairs under Agricultural Works for 1884-85.

—	Minor Original Works.										Repairs.									
	River Conservancy.		River Embankments.		Drainages.		Miscellaneous.		Total.		River Conservancy.		River Embankments.		Drainages.		Miscellaneous.		Total.	
	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.	Amount applied for	Proposed grant.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Vizagapatam	..	..	..	..	..	..	..	..	..	..	500	500	..	..	..	..	..	..	500	500
Godávari, Eastern ..	500	500	500	500	..	..	700	400	1,700	1,400	12,500	7,000	7,500	4,500	..	..	..	..	20,000	11,500
Do. Central ..	..	..	..	..	..	..	..	..	..	..	10,000	5,000	5,000	2,500	..	..	..	..	15,000	7,500
Do. Western ..	..	..	..	..	..	..	..	..	..	..	7,000	5,000	8,000	2,000	..	..	..	..	15,000	7,000
Kistna, Eastern ..	..	..	..	..	..	..	..	..	..	..	2,500	1,000	10,000	9,000	..	..	..	..	12,500	10,000
Do. Western ..	..	..	..	..	..	..	..	..	..	..	1,000	1,000	2,000	2,000	..	..	..	..	3,000	3,000
Nellore	500	500	500	500	..	..	..	..	1,000	1,000	500	500	1,000	1,000	..	..	..	..	1,500	1,500
Cuddapah	..	..	..	..	..	..	..	..	..	..	2,000	1,500	2,000	1,000	..	..	..	..	4,000	2,500
Chingleput	1,000	1,000	..	..	..	..	..	..	1,000	1,000	..	..	6,000	2,000	..	..	..	..	6,000	2,000
South Arcot	..	..	..	..	..	..	300	300	300	300	5,000	5,000	2,000	2,000	..	..	..	..	7,000	7,000
Salem	..	..	..	..	..	..	350	350	350	350	500	500	..	..	..	..	..	..	500	500
Coimbatore	1,000	1,000	1,000	1,000	..	..	600	500	2,600	2,500	8,000	8,000	2,000	2,000	..	..	..	..	10,000	10,000
Tanjore	..	..	1,000	1,000	500	500	..	..	1,500	1,500	16,000	16,000	25,000	23,000	1,000	500	..	..	42,000	39,500
Negapatam	..	..	..	..	..	..	..	..	..	..	10,000	6,000	20,000	15,000	..	..	..	..	30,000	21,000
Trichinopoly	2,000	2,000	3,000	3,000	1,000	1,000	..	..	6,000	6,000	10,000	7,000	20,000	11,000	1,000	500	..	..	31,000	18,500
Tinnevelly	..	..	2,000	2,000	..	..	..	..	2,000	2,000	..	..	3,000	3,000	..	..	..	..	3,000	3,000
Total ..	5,000	5,000	8,000	8,000	1,500	1,500	1,950	1,550	16,450	16,050	85,500	64,000	1,13,500	80,000	2,000	1,000	..	..	2,01,000	1,45,000
Reserve	..	..	..	..	..	..	..	..	..	1,950	..	..	..	..	..	..	..	..	..	5,000
Total ..	..	..	..	..	..	..	..	..	..	18,000	..	..	..	..	..	..	..	..	..	1,50,000

Proceedings of the Madras Government
Revenue Department
Read the following:—

7th January 1884, No. 17 I., Public Works.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

Note by the Acting Chief Engineer for Irrigation.

No. 162 I.

The budget estimates of Productive Public Works, and Irrigation and Navigation, Agricultural, and Protective works, for the ensuing year, together with the revised estimates for the current year, are submitted to Government with the following observations.

2. *Productive Public Works.*—The budget estimates of direct receipts from Productive Public Works collected in the Public Works Department, during the ensuing year, are compared below with the budget and the revised estimates for the current year, and the actuals for the previous year—

		RS.
Budget estimate, 1884-85	... ...	1,49,400
Revised ,, 1883-84	... ...	1,59,560
Budget ,, 1883-84	... ...	1,43,230
Actuals, 1882-83	... ...	2,12,901

The actuals for 1882-83 include the sale-proceeds of the stores belonging to the late Madras Irrigation and Canal Company (which were disposed of during the year), and the irrigation revenue from the Kurnool canal realized in the Civil Department. The estimates of such revenue, for the Kurnool canal, for the current and ensuing years are shown under "XXX. Portion of land revenue due to Irrigation", as in the case of all other productive public works. The increase of the revised over the budget estimate for the current year is due (1) to the increase of receipts to be credited to the Godávari delta on account of the Dowlaishweram workshops, on which there has been a large demand for works in the Godávari central delta, and (2) to the increase of navigation receipts in the Kistna delta. The budget estimate for the ensuing year is Rs. 10,160 less than the revised estimate for the current year, as it is expected that the increase of receipts on account of the Dowlaishweram workshops will not continue.

3. Irrigation revenue collected from the Kurnool canal was recorded in the Civil Department separately from land revenue when the late Madras Irrigation and Canal Company had charge of the canal. After its transfer to Government, the same procedure was allowed to continue, and the amount realized was shown in the Public Works accounts as direct receipts, as it was then intended* that the revenue due to all irrigation works, as ascertained by Mr. Wilson, should be deducted from Land Revenue, and shown separately in the Finance accounts and estimates. But the Government of India, in their letter, No. 24 A-I., dated 3rd February 1883, decided that no change, in the exhibition of land and irrigation revenue in the Finance accounts and estimates, is necessary. Irrigation revenue from the Kurnool canal, collected in the Civil Department, should therefore be credited to Land Revenue, the amount of ascertained demand

* *Vide* paragraph 10 of the Accountant-General's note communicated with the Proceedings of the Government of India printed with Proceedings of Madras Government, No. 149 I., of 21st February 1882.

of irrigation revenue being shown in the Public Works accounts and estimates as in the case of all other irrigation works. The budget estimates have been prepared accordingly, and a reference to the Government of India on this subject has recently been made.

4. The budget estimate for the ensuing year, and the revised estimate for the current year, of the portion of land revenue due to Irrigation, exclusive of collection charges in the Civil Department, as furnished by Mr. Wilson, and communicated with G.O., No. 1006 I., dated 8th December 1883, are compared below with the budget estimate for the current year, and the actuals for the previous year—

	RS.
Budget estimate, 1884-85	33,21,312
Revised „ 1883-84	33,09,248
Budget „ 1883-84	37,04,576
Actuals for 1882-83	31,93,529

The budget estimate for the current year has been reduced by Rs. 3,95,328, on consideration of the actuals of the past year, and of the average receipts for the past three years. The increase of the budget estimate for the ensuing year over the revised estimate for the current year is due to the closing of the breaches in the Soonkesala anicut and the Tangadancherla tank (connected with the Kurnool canal), which caused a decrease of revenue for the current year.

5. The provisional grants for expenditure fixed by the Government of India, in their Resolution, No. 121-A.I., dated 8th November 1883, printed in Proceedings of Madras Government, No. 1016 I., dated 10th December 1883, compare as follows with the revised and the budget estimates for the current year :—

	Capital Account. RS.	Revenue Account. RS.
Provisional grant for 1884-85	19,80,000	9,07,000
Revised estimate for 1883-84	17,90,302	9,53,368
Budget „ for 1883-84	15,00,000	12,09,600

6. The increase in the revised estimate of expenditure on Capital Account over the budget estimate for the current year is Rs. 2,90,302, made up of the following items :—

	RS.	RS.
Amount sanctioned for the Barur tank project in letter, No. 363 I., dated 16th October 1883, printed in Proceeding of Madras Government, No. 884 I., dated 8th November 1883		19,613
Amount sanctioned for compensation for land required for improving the Korampalem tank of the Srívaikuntham anicut project		20,377
Additional allotment sanctioned for Sangam anicut project ...		30,919
Additional allotment applied for for tools and plant of the Sangam anicut project		36,500
Additional allotment applied for to meet the estimated expenditure in England		13,480
Unadjusted balance of the purchase-money of the Kurnool canal. Amount shown in the Secretary of State's despatch received with the Government of India letter, No. 25 P.W., dated 9th November 1883, printed in Proceedings of Madras Government, No. 993 I., dated 5th December 1883 ...	1,77,96,600	
Amount adjusted in 1882-83	1,76,25,050	
Balance unadjusted		1,71,550
Total ...		2,92,439
Deduct amount surrendered from the grant for the Srívaikuntham anicut project, the tanks and channels being full of water during the working season		2,137
Net Total ...		2,90,302

7. The decrease in the revised estimate of expenditure on Revenue Account is Rs. 2,56,235 made up of the following items :—

		RS.
Old maintenance charges to be debited to irrigation and navigation works for which neither Capital nor Revenue accounts are kept		1,63,988
Balance surrendered of the amount allowed to stand pending further consideration of the method of distributing establishment charges		1,65,306
Total ...		3,29,294
	RS.	
Deduct—		
Additional allotment sanctioned for the Cauvery delta...	11,853	
Do. do. for the Pennér anicut system	12,450	
Allotment applied for for completing the telegraph line along the Kurnool canal	41,100	
Additional allotment applied for for repairing the flood damages to works in the Godávari delta	7,656	
		73,059
Net Total ...		2,56,235

8. The amount of contribution to Provincial funds on account of establishment, at 6 per cent. on indirect revenue, has been calculated on the amount of increase of irrigation revenue due to the improvements carried out by the British Government, excluding the collection charges in the Civil Department at 7·2 per cent. The difference between the amount provided for establishment at fixed rates of percentage on direct and indirect revenue in the budget estimate, and the amount provided for the purpose in the revised estimate, has been distributed to meet, in part, the demands made for additional allotments for maintenance and repairs to the Kistna and Cauvery delta systems, the amounts still required being met by reducing the grant for extensions and improvements to the Kurnool canal, as it is not likely that the grant will be fully utilized. The sanction of Government to the above modifications of allotments has been applied for in a separate note.

9. The Government of India have sanctioned in full the amounts applied for for expenditure during 1884-85, and the budget estimates have been prepared to correspond with the amounts fixed, which have been distributed as follows :—

	Capital Account.	Revenue Account.
	RS.	RS.
Works	14,55,297	1,16,564
Land compensation	1,50,865	...
Repairs	...	4,17,298
Total ...	16,06,162	5,33,862
Establishment at 23 per cent. on expenditure ...	3,34,718	1,22,788
Do. at 10 per cent. on direct revenue ...	...	14,940
Do. at 6 per cent. on indirect revenue...	...	1,75,170
	3,34,718	3,12,898
Tools and plant	39,120	60,240
Total ...	19,80,000	9,07,000

10. The budget estimates provide under Capital Account for—

—	Works.	Land compensation.	Establishment.	Tools and plant.	Total.
	RS.	RS.	RS.	RS.	RS.
Godávari delta	3,49,984	20,016	80,496	7,504	4,58,000
Kistna delta	3,93,097	26,403	90,412	15,088	5,25,000
Sangam anicut project	4,20,000	80,000	96,600	11,400	6,08,000
Cauvery delta	1,99,000	13,000	45,770	4,230	2,62,000
Srívaikuntham anicut	24,216	11,446	5,570	268	41,500
Barur tank	69,000	...	15,870	630	85,500
Total ...	14,55,297	1,50,865	3,34,728	39,120	19,80,000

11. The proposed expenditure, as compared with the estimates for direct charges, is as follows :—

—	Estimates.	Outlay.		Total.
		Estimated to end of 1883-84.	Proposed for 1884-85.	
	RS.	RS.	RS.	RS.
Godávari delta	1,10,88,695	96,16,315	4,58,000	1,00,74,315
Kistna delta	1,38,99,784	63,04,058	5,25,000	68,29,058
Sangam anicut	28,96,437	12,88,573	6,08,000	18,96,573
Cauvery delta	16,80,217	12,35,512	2,62,000	14,97,512
Srívaikuntham anicut ...	13,61,520	12,90,318	41,500	13,31,818
Barur tank...	3,20,000	1,19,683	85,500	2,05,183
Total ...	3,12,46,653	1,98,54,459	19,80,000	2,18,34,459

12. The estimates for all the above systems have been sanctioned by the Secretary of State. The Superintending Engineer, IV Circle, applied for Rs. 1,00,000 for expenditure on works of the Barur tank project, while the amount entered in the rough budget estimate was only Rs. 50,000. This amount has now been increased to Rs. 69,000, as the amounts applied for for the Godávari and Kistna delta systems were less than the amounts entered in the rough budget estimate.

13. Under special tools and plant, six composite punts, required for the Kistna delta works, have been provided for.

14. The proposed grants for extensions and improvements, and maintenance and repairs, for each system compare as follows with those of the current year :—

—	Extensions and improvements.		Maintenance and repairs.		Estimate of revenue due to improvements exclusive of collection charges.		Area irrigated.
	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1882-83.
	RS.	RS.	RS.	RS.	RS.	RS.	ACRES.
Godávari delta	15,000	20,000	1,63,000	1,75,000	15,21,920	15,21,920	504,213
Kistna delta	10,350	11,000	1,53,583	1,60,000	8,85,312	8,85,312	261,158
Pennér anicut	1,936	3,436	11,140	2,140	1,16,000	1,16,000	63,653
Kurnool canal	* 87,824	55,000	1,33,000	1,16,000	52,896	64,960	16,138
Cauvery delta	41,040	25,480	— 39,634	— 45,634	6,45,888	6,45,888	892,871
Srívaikuntham anicut	1,408	1,648	792	9,792	87,232	87,232	19,546
Total ..	1,57,558	1,16,564	4,21,881	4,17,298	33,09,248	33,21,312	1,757,579

* Including Rs. 41,100 for completing the telegraph line.

(*a*) The amounts entered for the Pennér anicut, the Cauvery delta, and the Srívaikuntham anicut systems under extensions and improvements, and maintenance and repairs, are exclusive of the old maintenance charges, which are provided for under irrigation and navigation works for which neither Capital nor Revenue accounts are kept.

(*b*) The minus figures entered for the Cauvery delta represent that the improvements carried out by the British Government have considerably reduced the cost of maintenance of the entire system.

(*c*) The Superintending Engineer, III Circle, has applied for Rs. 62,000 for extensions and improvements to the Kurnool canal, and the Superintending Engineer, II Circle, has applied for Rs. 2,500 for the quay-wall at Chebrole, which was not included in his budget estimate. But no more than Rs. 55,000 could be provided for the Kurnool canal, and the amount entered in the rough budget estimate for the Kistna delta could not be increased without prejudicially affecting the grants for other works.

(*d*) A larger grant than that of the current year is necessary for the proper up-keep of the works in the Godávari delta.

(*e*) The increased grant for maintenance and repairs to works in the Kistna delta is required for fitting new gates to several locks, and for keeping the Western delta main canal in good repair.

(*f*) As the special repairs to the Kurnool canal will be completed this year, the proposed grant for 1884-85 provides only for extensions and improvements and annual maintenance.

(*g*) Owing to presence of water in several tanks and channels of the Srívaikuntham anicut system, during the working season, repairs could not be carried out fully during the current year.

(*h*) The Superintending Engineer, II Circle, has applied for Rs. 16,000 for expenditure during 1884-85 on repairs to works of the Sangam anicut project on Revenue Account. As all repairs before the system commences to yield revenue should be charged to Capital Account under "Repairs during construction," the amount applied for on Revenue Account has not been provided. The Superintending Engineer anticipates that irrigation under the Sangam anicut will commence during 1884-85, but the probable estimate of revenue has not been stated, and the Superintending Engineer has been requested to furnish the information. The question whether the cost of repairs should be charged to Capital or Revenue account may be considered on receipt of the information from the Superintending Engineer.

(*i*) Under tools and plant, Revenue Account, of the Kistna delta, the Superintending Engineer, II Circle, has applied for Rs. 32,800, but only Rs. 26,370 could be provided as shown below—

	RS.
9. Navigation plant—	8,000
Steamer	800
Ferry balacut	459
12. Miscellaneous plant	-
13. Repairs—	10,211
Maintenance of floating plant	400
Do. of ferry balacuts	4,000
Special repairs to floating plant	2,500
License fees	
Total ...	26,370

(*j*) The amounts applied for for the Godávari delta, the Pennér anicut, and the Kurnool canal, under tools and plant, Revenue Account, have been reduced from Rs. 28,000 to Rs. 27,787, from Rs. 960 to Rs. 797, and from Rs. 6,500* to 4,772, respectively.

	RS.
* Special plant	5,000
General plant	1,500
Total ...	6,500

15. *H. Public Works not classed as Productive.*—The revised estimate for the current, year, and the budget estimate for the ensuing year, of direct receipts collected in the Public Works Department, under this head, compare as follows with the budget estimate for the current year and the actuals for the previous year:—

—	Works for which Capital and Revenue accounts are kept.	Works for which neither Capital nor Revenue accounts are kept.	Agricultural works.	Total.
	RS.	RS.	RS.	RS.
Budget estimate, 1884-85	650	12,000	10,000	22,650
Revised „ 1883-84	420	12,000	10,000	22,420
Budget „ 1883-84	420	15,000	19,000	34,420
Actuals for 1882-83	351	12,146	10,130	22,627

The revised estimate for the current year and the budget estimate for the ensuing year are based on the actuals for 1882-83, while the budget estimate for 1883-84 is based on the actuals for 1881-82.

16. The revised and the budget estimates of indirect revenue, exclusive of collection charges in the Civil Department, are as shown below—

—	Works for which Capital and Revenue accounts are kept.	Works for which neither Capital nor Revenue accounts are kept.	Total.
	RS.	RS.	RS.
Budget estimate, 1884-85	1,46,810	77,95,200	79,42,010
Revised „ 1883-84	1,46,810	77,95,200	79,42,010
Budget „ 1883-84	1,39,107	79,91,936	81,31,043
Actuals for 1882-83	1,45,192	78,00,978	79,46,170

The above figures do not include the portion of revenue due to old irrigation under the systems for which Capital and Revenue accounts are kept. As the Government of India stated, in paragraph 3 of their letter,* No. 63 A.I., dated 20th April 1883, that indirect revenue of works other than those classed as Productive need not be entered in the budget estimates, they are now omitted.

* Printed in Proceedings of Madras Government, No. 418 I., of 25th May 1883.

17. The amount assigned by the Government of India for expenditure during the next year is Rs. 24,45,000, or Rs. 50,000 less than that applied for, and compares as follows with the budget and the revised estimates for the current year and the actuals for the previous year:—

	RS.
Budget estimate, 1884-85	24,45,000
Revised „ 1883-84	22,94,935
Budget „ 1883-84	19,78,300
Actuals for 1882-83	20,89,022

The increase of the revised over the budget estimate for 1883-84 is Rs. 3,16,635, made up of the following items:—

	RS.
Old maintenance charges of productive public works	1,63,988
Contribution to Provincial funds for establishment at 6 per cent. on the portion of revenue due to old irrigation under productive public works, excluding collection charges in the Civil Department at 7·2 per cent.	1,52,647
Total ...	3,16,635

18. The difference between the amount provided for establishment at fixed rates of percentage on direct and indirect revenue in the budget estimate, and the amount provided for the purpose in the revised estimate, has been distributed between Repairs, Establishment, and Tools and Plant, and the balances of reserve for repairs at the disposal of Government have therefore been increased as shown below—

	From	*To*
	RS.	RS.
Irrigation and Navigation Works for which either Capital nor Revenue accounts are kept.		
Repairs.		
Reserve at the disposal of Government	20,238	24,284
Agricultural Works.		
Repairs.		
Reserve at the disposal of Government	520	786

19. The amount sanctioned for Irrigation and Navigation and Agricultural works has been distributed as follows :—

—	Irrigation and Navigation works for which Capital and Revenue accounts are kept.		Irrigation and Navigation works for which neither Capital nor Revenue accounts are kept.	Agricultural works.	Total.
	Capital.	Revenue.			
	RS.	RS.	RS.	RS.	RS.
Works	55,000	3,480	2,16,434	1,70,482	4,45,396
Works in the Tank division	..	..	1,96,970	..	1,96,970
Repairs to Imperial works	..	25,436	6,80,766	1,50,000	8,56,202
Do. to minor irrigation works ..	..	..	3,70,000	..	3,70,000
Total ..	55,000	28,916	14,64,170	3,20,482	18,68,568
Establishment at 23 per cent. on expenditure	12,650	6,651	2,06,356	73,711	2,99,368
Establishment at 10 per cent. on direct revenue	..	65	1,200	1,000	2,265
Establishment at 6 per cent. on indirect revenue	..	..	1,52,786	..	1,52,786
Special establishment	..	..	1,00,630	..	1,00,630
Total ..	12,650	6,716	4,60,972	74,711	5,55,049
Tools and plant	350	368	15,858	4,807	21,383
Total ..	68,000	36,000	19,41,000	4,00,000	24,45,000

20. The following works have been provided for under Capital Account :—

	RS.
Pálár anicut system—	
Northern section improvements	30,000
Pelandorai anicut system—	
Storage works	25,000
Total ...	55,000

The completion estimates for these projects will be submitted shortly.

21. The allotments proposed for extensions and improvements, and for maintenance and repairs, compare as follows with those of the current year :—

—	Extensions and improvements.		Maintenance and repairs.		Estimate of revenue due to improvements exclusive of collection charges.		Area irrigated.
	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1882-83.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Chembrambaukam tank	— 683	— 1,283	10,736	403	33,037	33,037	12,763
Pálár anicut	3,822	3,822	22,927	17,091	1,07,184	1,07,184	66,212
Pelandorai anicut	8,370	941	15,967	7,942	6,589	6,589	3,386
Total ..	11,509	3,480	49,630	25,436	1,46,810	1,46,810	82,361

22. The allotments proposed for irrigation and navigation works for which neither Capital nor Revenue accounts are kept compare with those of the current year as follows:—

—	Original Works. Major.	Original Works. Minor.	Repairs.
	RS.	RS.	RS.
Allotment for 1883-84 ...	1,41,436	1,29,315	9,32,840
Do. for 1884-85 ...	2,76,968	1,36,436	10,50,766

23. Of the amount provided under major works, Rs. 1,96,970 are for expenditure in the two Tank divisions, which, together with the cost of establishment and tools and plant, amounts to Rs. 3,00,000,* in accordance with the programme approved by the Government of India, in their letter printed in Proceedings of Madras Government, No. 143 I., dated 12th February 1883. Owing to the unavoidable delay which occurred in appointing the establishment required for the No. 1 Tank division, and to the presence of water, during the working season, in the tanks in the Periyakulam taluk, in the Madura district, where the operations of the Tank division commenced, the current year's grant for expenditure in the Tank divisions could not be fully utilized, and Rs. 63,600 of the grant has, therefore, been transferred for appropriation for expenditure in other divisions. No. 2 Tank division will be formed from the 1st March next, and will work in the Chingleput district.

	RS.
* Works	1,96,970
Establishment	1,00,630
Tools and plant	2,400
Total ...	3,00,000

24. The following major works, for which the estimates have been duly sanctioned, have been provided for:—

	RS.
Nellore division.—Zaladanki tank weirs	2,750
Zammalapalem tank improvements	1,020
Bogavolu tank improvements	5,654
Betragunta tank do.	1,716
Bellary.—Bookapatam tank improvements	4,930
Presidency.—Mylapore tank do.	3,523
South Arcot.—Allangal channel head-sluice	4,250
Allangal two outlets and head-sluices on the Kondamanady branch channel	4,887
Veyalore tank improvements	2,940
Chengam do.	3,521
Coimbatore.—Chitrachavady channel improvements	8,223
Pullapollem channel	10,300
Calingaroyen channel aqueduct	1,870
Negapatam.—Ollacannum Terkuyeri tank	1,920
Tinnevelly.—Manur channel improvements	7,068
Pallikottai channel	5,210
Wattrap Periyakulam	5,685
Papankal channel head-sluice	4,532
Total ...	79,998

25. The distribution of the grants for Minor Original Works and Repairs, by divisions, is shown in the statement A attached to this Note. Rs. 3,70,000 have been provided for repairs to Minor Irrigation Works now under the charge of Collectors. This amount will be held at the disposal of the Board of Revenue for appropriation to the several districts. Government, in the Revenue Department, have accepted* the Board's recommendation that four lakhs of rupees should be provided for the up-keep

* G.O., No. 3463 W., dated 3rd December 1883.

of Minor Irrigation Works, but the total amount fixed by the Government of India does not admit of a larger grant than Rs. 3,70,000.

26. The proposed allotments for agricultural works compare with those of the current year as shown below—

—	Original Works.		Repairs.
	Major.	Minor.	
	RS.	RS.	RS.
Allotments for 1883-84	1,53,895	14,684	1,80,270
Do. for 1884-85	1,52,482	18,000	1,50,000

27. The major original works for which funds are provided are—

River Embankments.

	RS.	RS.
Gowtami-Godávari L.B. Rajahmundry to Yanam ...	8,300	
Godávari L.B., Purushottapattam to Rajahmundry ...	10,000	
Tharigada vagu outfall sluice	12,000	
Vasista Godávari L.B. to Gunnaram aqueduct	5,000	
Gowtami-Godávari and Viridhi-Gowtami Godávari to Mokaltippa	6,000	
Polaveram island embankment	3,000	
Vasista-Godávari L.B. below Gunnaram aqueduct ...	3,000	
Vynateyam-Godávari R.B.	3,000	
Do. L.B.	3,000	
Godávari R.B. Vijeshwaram to Polaveram	23,200	
Vasista-Godávari R.B. from anicut to Narsápur lock ...	775	
		76,275
Kistna river L.B. below anicut	10,000	
Do. R.B. do.	10,000	
		20,000
Papagni river R.B. above railway	6,207	
Cheyar river L.B.	10,000	
		16,207
Tambraparni river R.B. below Srívaikuntham anicut ...	20,000	
Do. L.B.	20,000	
		40,000
	Total ...	1,52,482

28. The distribution of the grants for Minor Original Works, and Repairs to Agricultural works, is shown in the statement marked B.

29. *Protective Works.*—The amount assigned by the Government of India under this head is Rs. 3,50,000, which has been distributed as follows :—

—	Works.	Establishment.	Tools and plant.	Total.
	RS.	RS.	RS.	RS.
Rushikulya project	2,00,000	46,000	3,000	2,49,000
Buckingham canal	1,01,000	...	...	1,01,000
Total ...	3,01,000	46,000	3,000	3,50,000

30. The revised estimate for the current year amounts to Rs. 2,71,433, the budget estimate being Rs. 2,00,000. A sum of Rs. 1,33,000 was sanctioned by the Government of India as a grant-in-aid for expenditure on original works of the Buckingham canal. As it is not found practicable to keep the strength of the establishment in the Project divisions to the sanctioned scale, the cost of investigating projects has been reduced from Rs. 1,16,000 to 54,433, which has been distributed as follows :—

—	Works.	Establishment.	Tools and plant.	Total.
	RS.	RS.	RS	RS.
A. Ganjam-Gopálpur canal	...	10,000	...	10,000
B. Púgalur and Calingaroyen channels ...	2,311	10,000	...	12,311
B. Vaniar project	80	5,000	...	5,080
B. Kishnaghiri reservoir	1,000	10,000	253	11,253
C. Bellary projects	420	5,000	180	5,600
D. Pálár anicut channels	189	10,000	...	10,189
Total ...	4,000	50,000	433	54,433

31. *Provincial Irrigation and Navigation Works.*—The budget estimate for 1884-85 of direct receipts under this head compares as follows with the revised and the budget estimates for the current year :—

	RS.
Budget estimate, 1884-85	39,060
Revised ,, 1883-84	72,580
Budget ,, 1883-84	1,29,000
Actuals, 1882-83	1,40,463

The decrease in the revised estimate for 1883-84 is due to the reduction of the rates of tolls and license fees on boats which ply on the Buckingham canal. The decrease in the budget estimate for 1884-85 is due to the fact that the amount to be paid by the Municipality for the supply of fresh water to the town of Madras is only for one year, while the amount paid during 1883-84 was the sum total of the arrears due for several years.

32. The budget estimate for 1884-85 of indirect revenue compares as follows with the revised and the budget estimates for the current year :—

	RS.
Budget estimate, 1884-85	9,837
Revised ,, 1883-84	9,837
Budget ,, 1883-84	...
Actuals, 1882-83	10,010

33. The amount assigned in the Financial Department for expenditure under this head is Rs. 2,10,500, which compares as follows with the revised and the budget estimates for the current year, and the actuals for the previous year :—

	RS.
Budget estimate for 1884-85	2,10,500
Revised ,, for 1883-84	3,62,000
Budget ,, for 1883-84	3,50,000
Actuals for 1882-83	3,53,102

The increase in the revised estimate is the amount allotted to meet the expenditure in England for pumps and engine required for the Buckingham canal. The amount assigned for expenditure during 1884-85 is quite inadequate for fair progress being made in carrying out the works sanctioned for the Buckingham canal. A special representation has been made to the Financial Department for a reconsideration

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of the allotment made for the canal with a view to increase the grant. The amount sanctioned has been distributed as follows :—

	Capital Account.	Revenue Account.
	RS.	RS.
Works	64,898	5,000
Repairs	...	77,659
Total ...	64,898	82,659
Establishment at 23 per cent. on expenditure ...	38,157	19,012
Do. at 10 per cent. on direct revenue ...	...	3,906
Total ...	38,157	22,918
Tools and plant	500	1,368
Total ...	1,03,555	1,06,945

34. The following is the distribution of the grant by systems :—

	Capital Account.	Revenue Account.
	RS.	RS.
Buckingham canal	80,000	95,000
Madras water-supply and irrigation extension project.	23,555	11,945
Total ...	1,03,555	1,06,945

35. The proposed expenditure, on Capital Account, is compared with the sanctioned estimates as follows :—

—	Estimate.	Outlay.		
		Estimated to end of 1883-84.	Proposed for 1884-85.	Total.
	RS.	RS.	RS.	RS.
Buckingham canal	86,12,000	* 52,21,106	* 1,81,000	* 54,02,106
Madras water-supply and irrigation extension project	15,69,239	15,10,958	23,555	15,34,513
Total ...	1,01,81,239	67,32,064	2,04,555	69,36,619

36. The grants for Extensions and Improvements, and for Maintenance and Repairs, for 1884-85 compare as follows :—

—	Extensions and Improvements.		Maintenance and Repairs.	
	1883-84.	1884-85.	1883-84.	1884-85.
	RS.	RS.	RS.	RS.
Buckingham canal	5,000	5,000	1,23,322	68,635
Madras water-supply and irrigation extension project	228	...	8,553	9,024
Total ...	5,228	5,000	1,31,875	77,659

As the damages caused to the Buckingham canal by floods will be repaired this year, the proposed grants for maintenance and repairs provide only for the annual maintenance.

* Including expenditure from Famine Relief Funds.

37. As the charges for Establishment are made at fixed rates of percentage on revenue and expenditure, the rates of percentage, which the charges for Establishment bear tothe expenditure on Works and Repairs, need not be shown in separate statements as required in the Resolution of the Government of India, No. 381 A.G., dated 30th November 1883, communicated with G.O., No. 3224 W., dated 15th December 1882.

38. The contributions to Provincial funds on account of Establishment and Tools and Plant for the current and ensuing years are as shown below—

—	Establishment Charges.					Tools and plant charges at $1\frac{1}{2}$ per cent. on expenditure.
	23 per cent. on expenditure.	10 per cent. on direct revenue.	6 per cent. on indirect revenue.	Special establishment.	Total.	
	RS.	RS.	RS.	RS.	RS.	RS.
1883-84.						
Imperial.						
Productive public works	3,82,839	15,956	1,74,446	694	5,73,935	..
Irrigation and navigation and agricultural works.	3,10,227	2,242	1,52,786	51,255	5,16,510	17,160
Protective works	11,500	..	..	50,000	61,500	..
Provincial.						
Irrigation and navigation works	88,473	7,258	..	..	95,731	..
Total ..	7,93,039	25,456	3,27,232	1,01,949	12,47,676	17,160
1884-85.						
Imperial.						
Productive public works	4,57,506	14,940	1,75,170	..	6,47,616	..
Irrigation and navigation and agricultural works.	2,99,368	2,265	1,52,786	1,00,630	5,55,049	18,265
Protective works	46,000	..	..	..	46,000	..
Provincial.						
Irrigation and navigation works	57,169	3,906	..	..	61,075	..
Total ..	8,60,043	21,111	3,27,956	1,00,630	13,09,740	18,265

CHEPAUK,
28th December 1883.

(Signed) A. S. RUSSELL,
for Acting Chief Engineer for Irrigation.

To the Acting Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 7th January 1884, No. 17 I., Public Works.

The budget estimates for 1884-85, and the revised estimates for 1883-84, as drawn up by the Chief Engineer for Irrigation, and the distribution, by divisions, of the grants for Minor Original Works and Repairs, shown in the statements A and B, are approved.

2. The amount of Rs. 3,70,000 provided for repairs to Minor Irrigation Works will be placed at the disposal of the Board of Revenue for appropriation to each district.

3. Ordered that a copy of these Proceedings, together with the budget estimates, be forwarded to the Government of India.

(Here enter No. 18 I., dated 7th January 1884.)

(True Extract.)

(Signed) J. O. HASTED, Colonel, R.E.,
Ag. Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To Superintending Engineers.
To the Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Revenue Department.
" Financial "

Exd. E. Fernandez.
Spare Copies

Order thereon, 22nd January 1884 No. 326

Communicated to the Board of Revenue and the Director of Revenue settlement and Agriculture

(True Extract)
(Sd.) Sidney Lifton
Ag. under Secy to Govt.

the Director of Revenue settt. & Agriculture

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In No 305/84

IRRIGATION.
ACCOUNT.

Govt. of {1884} Madras.

PUBLIC WORKS.

Dated January, 7th.

Recd. Encl.

G.O., 7th Jan. 1884, No. 17 I.

JANUARY.

No 34/15

Communicated to the Officers in charge of Settlement Parties.

Dept. of Rev. Sett. & Agre. Madras 7 February 1884

(By order)

[signature]

1st. Assistant

To,

The Dy. Director of Reve. Settt.

Party No. III

Budget Estimates

The — for 1884-85, and the revised estimates for 1883-84, for irrigation works, approved.

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Revenue Department
Proceedings of the Madras Government
Read the following

16th January 1884, No. 37 I., Public Works.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers :—

Proceedings of the Public Works Department, dated 30th November 1882, No. 963 I.
" " " " 23rd " 1883, " 951 I.
" " " " 5th December " " 993 I.

No. 164 I.

Note by the Acting Chief Engineer for Irrigation.

The following statement, taken from the *Gazette of India*, dated 27th October 1883, shows the operations of all works, in the Presidency, for which Capital and Revenue accounts are kept, from the year 1879-80 to 1882-83 :—

Statement showing operation of irrigation works in the Madras Presidency for the years 1879-80 *to* 1882-83.

—	Capital Expenditure (Direct and Indirect) to end of Year.			Gross assessed Revenue, Direct and Indirect.	Maintenance Charges, Direct and Indirect.	Net Revenue.	Percentage of Net Revenue on Capital Outlay to end of year.	Acres irrigated.
	Productive Public Works.	Public Works for which Capital and Revenue accounts are kept.	Total.					
	RS.	RS.	RS.	RS.	RS.	RS.		
1879-80	2,04,42,429	23,73,646	2,28,16,075	38,07,921	11,12,151	26,95,770	11·81	19,17,129
1880-81	2,07,57,153	28,38,935	2,35,95,088	41,05,459	13,99,482	27,05,977	11·47	18,88,307
1881-82	2,09,95,698	29,24,961	2,39,20,659	36,30,105	11,55,884	24,74,221	10·34	18,13,795
1882-83	3,91,03,451	28,04,582	4,19,08,033	35,02,255	9,11,729	25,90,526	6·18	18,48,267

It will be noticed that the percentage of net revenue on capital outlay in 1882-83 was only 6·18, as against 10·34, 11·47, and 11·81 in the three years immediately preceding. This very sudden and large decrease in 1882-83 is entirely due to the purchase by Government in that year of the Kurnool canal from the late Madras Irrigation Canal Company, and to its classification as a productive public work.

2. Owing to the enormous capital outlay expended on this work it is impossible that the large irrigation works of the Madras Presidency, judged as a whole, can ever again show the high percentages of net revenue to capital outlay, which (prior to 1882-83) they have hitherto done. It is therefore thought that it would be well to attach a footnote to every financial statement in which the Kurnool canal finds a place, in order that this fact may be made patent to all who peruse such statements.

(Signed) A. S. RUSSELL,
for Ag. Chief Engineer for Irrigation.

Chepak,
21st December 1883.

To the Acting Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 16th January 1884, No. 37 I., Public Works.

The Government approve of the recommendation of the Chief Engineer for Irrigation, and direct that the following permanent footnote be appended to all financial statements which exhibit the accounts of the Kurnool Canal :—

Footnote.

"Includes the late Madras Irrigation Canal Company's canal, a work on which the system of carrying out irrigation works by private enterprise was tried as an experiment under the orders of the Secretary of State. This work resulted in a disastrous financial failure, and in 1882-83, when it was purchased by Government, the percentage of net revenue to capital outlay of the irrigation works of Madras for which Capital and Revenue accounts are kept was reduced to 6·18, as against 10·24, 11·47, and 11·81 in the three years immediately preceding."

(True Extract.)

(Signed) J. O. HASTED, Colonel, R.E.,
Ag. Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Financial Department.
" Revenue "
" Superintending Engineer, III Circle.

Order thereon, 28th January 1884, No. 421

Communicated to the Board of Revenue and the Director of Revenue Settlement and Agriculture.

(True Extract)

(Signed) Sidney Laffan
Ag. under Secy to Govt.

To
The Board of Revenue.
" Director of Revr. Settlement & Agriculture.

Exd. E. Fernandez.
Spare Copies

In No. 333/84

IRRIGATION.

Govt. of (1884) Madras.

PUBLIC WORKS

Dated January, 16th.

No 403
18

Recd. *Encl.*

G.O., 16th Jan. 1884, No. 37 I.

Communicated to the officers in charge of Settlement Parties Nos I, II, III, and V

Dept: of Reve: Settt
and Agriculture
Madras 9th February 1884
(By order)
[signature]
1st Assistant.

To,
The Dy. Director of Reve: Settt
Party No. III

JANUARY.

Kurnool Canal

The recommendation of the Chief Engineer for Irrigation that a permanent footnote, as suggested by him, be appended to all financial statements which exhibit the accounts of the —, approved.

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Comp. [illegible]

11TH JANUARY 1884, No. 28, REVENUE.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 2nd November 1883, No. 3292 :—

READ—the following letter from C. BENSON, Esq., M.R.A.C., Assistant Superintendent, Government Farms, to the Director of Revenue Settlement and Agriculture, dated Guindy, 8th September 1883 :—

I have the honor to submit the following report of the tour from which I have recently returned.

Objects of tour.

2. In June last, I received your instructions to proceed to the Godávari and Kistna districts during the vacation of the School of Agriculture, with the following objects :—

(1) To make inquiries regarding—

(i) a parasitic plant attacking tobacco;

(ii) a disease—kôdu—attacking paddy.

(2) To report regarding the feasibility of some experiments being made in treating choudu land by trenching and drainage.

(3) To inquire into the growth of sugar-cane in the Godávari district.

(4) Generally to study the agricultural systems pursued.

Route.

3. Pursuant of these instructions, I left head-quarters on the 27th June and reached Cocanada on the 30th, where I made arrangements for my tour, the Collector kindly placing his boat at my disposal till I could get another. I left on 2nd July by the Sámalkót canal, and, halting at Bhímavaram, made an excursion to Peddápuram before I moved further up. I then went down to Rámachandrapuram and Jaganadhagiri, and thence up *viâ* Alumur and Madiki to Dowlaishweram and Rajahmundry. After this, I left on the 13th for the central delta, but only travelled down and up the Amalápuram canal; whilst in this delta I visited several of the lankas where the tobacco crop is chiefly raised. After crossing on 21st July to the western bank of the river, I went down to Narsápur and back, halting at several places *en route*, and whilst there going out as far as Mogaltur; and then I proceeded to Ellore on 27th July and on to Bezváda. From the last place, I crossed the Kistna and went down the western bank canal, as far as I could, to Kolluru, and then down the Commamur canal to Chabrole, from whence I returned to Bezváda on 7th August to see the Collector regarding the choudu experiments you suggested. It was only on my return to Bezváda that I received the intimation that I might stay in the district till the end of the month, but I could not then well arrange to fill up the remaining time usefully. From Bezávda, I made excursions to Ganavaram and Kondapilli. I then proceeded to Bandar to see the Temporary Deputy Collector regarding the choudu land; and, after consulting with him, I returned to Pamarru, and also visited Gowtaram and Nandigam, and then returned

to Bandar, where I had to wait for a steamer to bring me down to Madras, which I reached on the 23rd August, having been absent nearly two months.

Reports submitted.

4. I have already submitted reports regarding the tobacco parasite, called bôdu in the Godávari and mallé in the Kistna, and on the subject of the suggested experiments with choudu land in the Kistna, as well as some special remarks regarding the Sweedish ploughs sent to the Godávari district for exhibition. The other points to which you drew my attention, I shall refer to in this report, but most of my time was spent in making myself generally acquainted with the agricultural system of the tracts I went through, which, however, I must say presented few, if any, new aspects to me, or which I have not already described in reports of previous tours. At your suggestion, I travelled almost exclusively by boat, and thus my tour was confined almost entirely to the two deltas, and there was consequently much less variety in it than if I had passed through a more varied tract of country. Paddy is the great crop of the deltas, and in fact in many places there is little else to be seen for miles together, and it is a supremely uninteresting system of cultivation.

Irrigated paddy.

5. *Irrigated Land.*—The management of irrigated paddy land is simple in the extreme, and does not vary much in the two districts. All the crop is transplanted, and consequently all the land is prepared in the wet state. The amount of puddling varies slightly in different parts, and in the Kistna, on some stiff clay near Chabrole, I found that the ryots gave their land a first ploughing dry; generally, however, to plough the irrigated land dry is looked upon as a mistake. The land gets little or no manure from the hands of the ryots; what little manure remains after providing fuel is used for the seed-beds and special crops, such as tobacco, chillies, &c. Cattle are to a limited extent folded on the fields, but the area so treated is very small indeed. The use of green leaves for manure, so common a practice in many other places, is not known apparently, and I was very much struck when at Ellore by the facility with which the ryots might supply themselves with leaf manure by growing the Kanuga tree (*Pongamia glabra*) around their fields as is done in North Arcot, Cuddapah, and Bellary, and the soil there would be much benefited by the use of such manure. In general, however, the necessity for using manure on the irrigated land has not been felt. Writing in 1879 regarding the valley lands in Trichinopoly, I remarked: "The people in the valley owe little to their own endeavours, nearly all their wealth being a gift of nature—a gift the utilization of which to its fullest extent few of them attempt. Very few of the cultivators do anything more than plough and sow the lands they occupy. Nature does all the rest." This is as true of the Godávari. The ryot does little, whilst nature, guided by the hands of the State Engineers, does a vast amount for him. To stir up the puddle of his fields three or four times and to plant the seedlings is considered all that is necessary by the ryot, and thereafter all is left to nature. The land when planted is often very foul. The water which is used unstintedly is very rich in silt; more so, however, in the Kistna than in the Godávari canals, and is a powerful fertilizing agent as well as stimulator of growth. This deposition of silt must ultimately lead to considerable difficulties by raising the land above the level of the canals.

Manure for paddy.

Croping seasons.

6. Whilst I was moving about in the Godávari, some land was being planted and the rest had already been, and in fact by the time I left the district at Ellore the crop was all, or nearly all, put in. In the Kistna, on the other hand, much land was still untouched by water or the plough, and the district is always much behind the adjoining one, for not only is there no water in the Kistna canals during the hot weather, but the people will not begin to take water till much later than in the Godávari. Water is said to be available in the Kistna from June onwards, but the demand does not begin till August, and then every one wants it at one time.

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Seed-beds.

7. In the Godávari, the seed-beds are prepared early in the year, and generally a little water is available in the canals for the purpose. The preparation is generally begun some time after the new year's day, but may be at any time from April to June. A lucky day, however, is selected by the calendar to begin on. The land selected is manured beforehand by folding cattle on it, but I found it almost impossible to determine the time they are so folded. It is then ploughed up dry to a fair depth (4″ 6″) and the paddy sown broadcast at the rate of about 40—50 lb. for every acre that it is intended to plant out; the seed is sown very thickly, and the seedlings are generally considered fit to plant out when a month or six weeks old. If they are allowed from any cause to grow longer in the beds before planting, the crop will not be so good, as they do not tiller and the ears that develope will be inferior in size. Most of the seedings that I saw being planted were at least two months old.

Management of the crop in the field.

8. The seedlings are planted out in the puddle by women; generally about ten women per acre being considered the proper number, but it varies with the soil. Water is kept on the field throughout the period of growth till shortly before the crop ripens, when the land is in some cases dried. The water is changed generally about once a week, if possible. The crop is not cut till it is dead ripe, although the ryots admit that they incur a loss thereby, in one case admitting to 40 seers per acre; but they explain their practice as being due to the difficulty of obtaining labor at harvest time. The crop is cut with a sickle and very long,—the stubble being afterwards grazed down,—tied in sheaves, and stacked and kept for threshing at a convenient time, although some times it is threshed out immediately after cutting. Threshing is effected by treading out by cattle and winnowing by the wind. The crop is generally on the land five months, and it is seldom that any attempt at raising a second crop is made. Sometimes a three-months crop is grown in order to raise money early in the season.

9. In the Kistna, the only differences are the later sowing of the seed-beds, and the first ploughing of the land being in some cases performed dry. This last practice is a decided improvement.

10. Paddy land is never broken up immediately after harvest and left so during the dry weather. The ryots do not approve of the idea. I believe, however, that the practice would be beneficial, but it is not *according to custom.* It is possible that, on some of the lighter lands of the Godávari, ploughing dry might cause a loss to the surface soil of the silt previously deposited in it, but the real objection is, I imagine, that, if the land were broken up, there would be no grazing on it. Probably some of the insect attacks which the crop suffers from are due to this practice of leaving the land unploughed and covered with weeds.

Diseases.

Kôdu.

11. The paddy crop has several diseases which at times cause considerable loss. One of the chief of these is the kôdu, which is characterised by a suppression of the ear stalk and its termination in a closed tube, instead of its going on growing and ultimately throwing out the flower. This generally appears first on the original main stem and may not affect more, but not infrequently it appears on all the subsidiary stems of a clump, and then of course the loss is considerable, for no ears are formed. I was unable to find out any cause to which I could ascribe this disease, but I obtained some specimens and forwarded them for Professor Lawson's opinion as to what it is, but have not yet learnt it, so will not venture any remarks of my own. The kôdu is first generally observable about six weeks after the crop has been put out, and it goes on increasing in amount thereafter. There was not much visible when I was in the district. It is ascribed by the ryots chiefly to bad weather, but I could not find out from the ryots what sort of weather they attributed it to. "Some sort of bad wind" was the explanation generally given. In

some places it was attributed to too much water, but again in others, too little water was said to cause it; and it appears indifferently on poor or rich soils.

12. There are two sorts of stem-borers which attack the paddy—the *dumpa pôdu* and *usa tiru*. I have not been able to recognise them. They at times inflict a good deal of injury on the crop. I saw specimens of both. The "*dumpa pôdu*" or "*teyulu*" is found in the stem an inch or so above the root and whilst the plant is still young. The specimens which I found were about ¾" long and as large as could be contained in a fair-sized paddy stalk; of a pale yellow color, with two brown spots on the head. Although this insect, or rather larva of some insect, in a measure resembles the American stalk borer,* it is not, I think, the same. It works in much the same manner and probably may be allied to it.

Dumpa pôdu.

The effect of this attack is to absolutely destroy the plant or stem affected.

13. The *usa tiru* resembles the *dumpa pôdu* very closely and may be the same. It is, however, only of about one-third the diameter of the latter, and is found at the bottom of the ear stalk, and causes the ear to become white and blasted by cutting off the supplies of sap from below. I may quote here the following remarks from the United States Agricultural Department Report for 1881-82 regarding the rice stalk borer as being appropriate regarding—

Usa tiru.

"*Preventive Measures.*"

"The borer in the fields Mr. Howard examined occurred in about one-fifth of the blasted stalks. It was sufficiently abundant, in fact, to make its destruction a matter of some importance. The latter brood, if there is one, must take to the volunteer rice around the edges of the fields or to the large grasses growing upon the embankments, though none were found in such. It is the custom some time during the winter to burn the stubble over the entire plantation. Great care is however taken not to allow the fire to reach the trash near or upon the embankments, as the soil of which there are made is of such character to burn readily, and their bulk would be greatly reduced by such a burning. Instead, then, of burning the weeds and volunteer rice along these banks, they are simply cut. It is probably here that the insect hibernates, either as larva or pupa, and it will be necessary to cut most carefully the wild rice and grass close to the ground and carry it to some safe place where it can be thoroughly burned."

14. Besides the above named, "deaf ears," going by the Telugu names of *pollu* or *bundu*, not unfrequently occur. I did not see any. They are ascribed in some places to the effect of high winds coming when the plants are flowering. This may possibly be a cause; for a high wind might easily blow away the pollen from the flower and so prevent fertilization. On this again the following remarks regarding what is called "white blast" in America may be quoted:—

Deaf ears.

"From the above observations it would seem that the blast is the after effect of some insect injury earlier in the season, although no traces of extensive work either upon stalks or heads was to be seen. It may be the puncture of some plant-bug, possibly of the clinch-bug, arresting the nourishment of the head and predisposing it to the attacks of some fungus growth, though no fungus was detected other than black patches on the husks of the grain, which are evidently a result rather than a cause of the disease.

"It is possible also that the work of the water-weevil earlier in the season, when it abounds, may have some influence in causing the blast. The subject is one which should be studied the whole season through in order to arrive at satisfactory results.

"The plan already suggested in treating of the borer, viz., of carefully collecting and burning the trash of the embankments, would of course prove effective in destroying many of these other insects, and in so doing might have a beneficial effect upon the blast."

15. I also find the following note in my diary, made at Kykaram, in the Godávari district:—"Kôdu appearing on crops now out a month. Soil is poor and light, but much benefited by irrigation. Ryots also showed me a large number of plants cut off and destroyed just below the surface (of water) by some insects—ascribed to crabs, but probably the work of some grub which finds a good home in banks and fields before ploughing for paddy as they are not touched; the former

* Described in the United States Agricultural Department Report for 1881-82, page 133.

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also very badly kept and fields generally small, apparently attack moves down from W. to E." That is with the wind. I could not find any insect or grub in the fields affected, but certainly the damage done is very considerable.

16. It would be well if these paddy insects and diseases could be investigated by a fully qualified person, as it seems to be probable that their attacks may continue and increase in effect. The investigations of the United States Entomological Commission might afford some information, but I have not got access to them.

17. Of the irrigated land, there is not much occupied by other crops than paddy. Occasionally gingelly is grown on the land after the paddy has been harvested in the cold weather or on the seed-beds. Pulses also are in a few cases sown amongst the paddy before harvest. Sunu is in some places sown on the paddy land for fodder and manuring purposes. Turmeric and sugar-cane and topes of cocoanuts and areca palms are all grown on land that can be irrigated—usually from the canals.

18. *Areca-nut.*—Near and around Amalápuram, gardens of this palm are common and are very profitable. The trees are planted 9′×9′ or about 540 per acre. The seed is sown in seed-beds, and germinates in about a month. When six months old the plants are transplanted into pits 3′×3′ apart, in which state they are kept three years, and then put out in holes at the distance first named and dug about 1 foot in diameter and of such depth as each plant may require; water is poured into the holes and the tree inserted and well pressed down, and afterwards watered daily for five months of the year—generally from wells. The gardens are frequently manured with sheep manure and kept ploughed to a fair depth. They last about twenty-five years, and each tree will yield ½ viss of nuts annually, or about 30 maunds of 25 lb. per acre, worth Rs. 5 per maund. Some vegetables are occasionally raised under these palms.

19. *Cocoanuts.*—In the same locality a large area is occupied by this palm. Seed is generally selected from old trees, the nuts being gathered when they turn yellow, and kept for four or five months till nearly dry before sowing. Seed from young trees is said not to produce good trees and that they die when they begin to flower. If the seed is not nearly dry before sowing, the germ is said to rot and die. When ready, the seed nuts are buried in the soil and come up in 3—6 months. When about six months old, the young plants are transplanted about 6 feet apart and left for two years, when they are finally planted out 30′ × 30 apart in holes about 15″×15″×1′. When ten years old, they will begin to yield fruit. The trees live seventy or more years, but begin to get old after the fiftieth year, and the yield decreases. When in full bearing, the yield is about 100 nuts a tree per annum. The nut is chiefly dried and exported, and the fibre of the nuts is only made use of to a very limited extent as such, being generally used for fuel. Every cocoanut garden is carefully cultivated and ploughed over annually; they are frequently green manured with crops of sunu, green-gram, &c., which are ploughed in or fed off; and once or twice a year it is general to dig around the trees, cutting off the old roots, and, after applying such manure as is available, to heap up the earth around the tree. Paddy, kora, samai and gingelly are sown in these gardens amongst the trees, partly for fodder and partly for manure; but they are also frequently kept for the crop they give themselves.

20. *Plantains* are grown on the same land as the topes already referred to are raised on, but there is little to note regarding their culture, except the distance apart (12′×12′) at which they are planted and the great length of time they are kept on the land, which is often ten years.

21. *Turmeric* is grown in both deltas and generally on stiff black clay soils, and is occasionally watered from the canals. Notwithstanding the comparatively small amount of water it takes, the crop has to pay double crop tax, Rs. 8 per acre, because it occupies the land a year; this appears to me to be a great hardship. The seed tubers are dropped in the furrows of a native plough in parallel lines, but alternately and not opposite each other.

Ginger is grown to a small extent at Pálakol, so famous for its oranges and limes, a sandy loam being preferred. It is, like turmeric, a one-year crop and is put in in June.

Onions and *Garlic* are raised on the same soils as turmeric, and in one place I found that saltpetre earth is collected and applied to the former crop. They are said to like high and dry spots best.

Chama (*Colocasia antiquorum*) and *Kanda* (*Typhonium Orixense*) are grown in some parts of the Godávari on the same soils to a considerable extent, but I have nothing to note regarding their cultivation.

Sugar-cane.

22. Excepting the cocoanut topes of the central delta, probably next to paddy, the most important crop grown under the Godávari canals is sugar-cane. According to agricultural statistics for 1879-80 (the latest I have access to), there were about 3,000 acres under this crop in the district; but, in the jamabandi report for the same year and published in the *same volume*, the area given by the Collector is 6,732 acres. I was also informed that, for the past year (1882-83), the area under this crop in the Peddápuram taluk was 5,351 acres; so that, either a most extraordinary extension of the area under the crop has taken place in the last three years, or the area in the delta is comparatively small. I believe a greatly increased area has been put under the crop of late years in the western delta. The figures which I give above, however, strikingly illustrate the value of our agricultural statistics!

Sorts grown.

23. That portion of the crop grown under the canals is chiefly raised in the western delta, but some also in both the central and eastern; and in the Peddápuram taluk also, it is, as already mentioned, extensively cultivated, but under river channels or tanks. At the last-named place and in the western delta indigenous varieties of cane are raised, but in the central and eastern deltas the Bourbon white cane is grown, sometimes by itself and sometimes mixed, with indigenous sorts. There are about eight sorts of cane recognised by the ryots, but of these two only seem to be very commonly grown, viz :—

(1) The *Námálu*, a striped cane, dark red and pale green, which grows about 12 feet high and 1½ inch thick, and yields a very plastic jaggery.
(2) The *Kéli*, a white cane growing 12 feet high and 1 inch thick, which yields rather less but more crystalline jaggery than No. 1. These two sorts are grown mixed together so as to get jaggery of good quality.

Soils and water-supply.

24. The soils on which I saw cane growing were mostly stiff loams At Peddápuram, it was a strong rich alluvium, apparently about 1 foot deep, lying on a sandy subsoil, but in the delta the soil is a uniform stiff loam or clay to a considerable depth. The water-supply being generally from the canals, and, as these seldom fail, except for a month or so during the year when a picottah in a hole in a corner of the field enables the ryot to get over the difficulty, is generally very good.

25. The crop generally occupies the land ten months or a year; but on the richer and stronger soils it is kept down for two years, and two cuttings are obtained from the same stools without replanting, the second being from ratoons. After the crop has been cut the land is usually broken up and prepared for paddy, and sugar-cane is not generally put down again for two, three, or more years.

Cultivation.

26. The preparation of the land may be said to begin in January as soon as the paddy crop is harvested, when in some cases it is sown with sunu hemp (*Crotalaria juncea*), which is, when about two months old, grazed down by cattle and is regarded as a valuable fertilizing agent. If sunu is not sown, the ryot begins to manure his land by folding cattle on it, but it is almost impossible to say how much is applied. This goes on during February and March, and in April the actual tillage begins; this consists in ploughing the land frequently, or in some cases digging it

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over with the crowbar and mamoti, until a good depth is attained, the latter process being by far the most effective, but not the most commonly adopted. In order to obtain a depth of 6 inches, the ryot finds it necessary to go over the land at least six times with his plough. During the preparation of the land, sweepings from the village are spread over it as an additional manure. When prepared, the field is laid out in beds and water turned in so as to thoroughly moisten the soil, and then the cuttings are pressed into the soft soil by the foot. The cuttings may consist of the tops only, but in some places all parts of the cane are used; generally three or four nodes, or pieces about 1 foot long, are planted $1\frac{1}{2}$ foot apart in either direction; this allows for a large number of failures. Soon after the cane sprouts, it is very common to sow green-gram (*Phaseolus mungo*) amongst the canes, which is ultimately pulled up and hoed in as a manure. As soon as the land is sufficiently dry after planting it is hoed up with a small spud,—*tolika,*—and this operation is repeated whenever required. In a good many places, but not everywhere, it is customary when the crop is about six weeks old to run trenches, about a foot wide and a foot deep, through the fields in two directions. This opens up the land and keeps it thoroughly free from stagnant water, and at the same time the trenches are useful for irrigation purposes. The soil, which is excavated in digging these trenches, is thrown up around the canes and is used for covering up the weeds and green-gram, which may be lying on the surface.

Special manures.

27. In the western delta, castor cake is generally and extensively used as a manure for cane, but not in the central or eastern deltas, and in the same way the use of saltpetre earth for the same purpose is much more common in the western than in the other deltas. A high price is paid for the castor cake, which is obtained from Cocanada, but its use is extending and is only of comparatively recent adoption.

Fencing.

28. In most places, the cane fields are carefully fenced with bamboos, but the extent to which the fencing is carried varies very much. At Peddápuram, no fencing is considered necessary; at Bhímavaram and other places in the western delta, the fencing is open and only close enough to turn cattled; whilst in the central and western deltas fencing is a very expensive thing, for the bamboos are set in the ground upright as closely as possible together so as to prevent the ingress of jackals, for a jackal in a single night may destroy several hundred canes.

29. When the cane is about three or four months old it is tied up to bamboos, planted one in the centre of each stool; this is to support the canes, five or six being tied up around one bamboo. The process is repeated once a month as the cane goes on growing. By this means the field is kept clear below, and it is possible to move about in it easily.

30. The frequency with which the crop requires watering depends chiefly on the weather. It may require water throughout its growth or yet may grow for six or eight months and never need watering. If there be no rain the crop should be watered once in about every ten days. It pays a double water-rate, but certainly does not use twice as much water as paddy.

31. The crop being put in in April, cutting and crushing begins in February, and is most active during March.

Cost and produce.

32. To arrive at any fair idea of the cost of raising the crop is most difficult, for there are several items which vary very much according to the capacity of the ryots and the soil. The poorer the soil the more expensive will the crop be. Again, it is difficult, if not impossible, to put a proper value on the manuring power of cattle folded on the land, and there is always a lot of labor done in a sugar-cane garden by the ryot at odd times which it is difficult to appraise. Besides this, it is difficult to tell how much faith can be put in the statements made by any of the ryots.

Premising these remarks, I give the following rough estimate for raising an acre of cane :—

	RS.	A.	P.
Ploughing up and preparing land ...	9	0	0
Manuring ...	15	0	0
Seeds and planting ...	20	0	0
Hoeing ...	10	0	0
Trenching ...	6	0	0
Tying up to bamboos ...	40	0	0
Fencing closely ...	18	0	0
Watching ...	12	0	0
	130	0	0
Land and water-rate ...	10	0	0
Cost of growing cane ...	140	0	0
Manufacture of jaggery ...	* 60	0	0
Total Cost ...	200	0	0

For ten Days per Acre.

* Daily—	RS.	A.	P.
Hire of mill ..	1	8	0
Fourteen coolies cutting and milling ..	2	10	0
Fuel ..	1	0	0
Lime pots, &c. ..	0	14	0
Total ..	6	0	0

The estimate is of little value and is only given in obedience to instructions. I found it impossible to arrive at any fair idea of the outturn obtained. Five to fifteen candies was frequently stated, but I incline to the higher figures; it will vary with every field and in every season. It must not be forgotten that there would be considerable drawbacks from the cost of raising the crop, if continued, for the bamboos used in fencing, &c., which are very costly, are used for at least two seasons. Then again, when the crop is kept down for a second year, several items of expense are avoided and the cost of the crop is at least Rs. 40 per acre less; the yield, however, is also said to be less.

33. The cane crop does not appear to suffer from insect attacks to any considerable degree, nor from other diseases; there is, however, a stem-borer which occasionally does some damage when the water-supply fails. It penetrates the shoots near the ground, and in consequence they wither up and die off.

34. The system of manufacturing jaggery is worth description. A mill, which consists of a pair of wooden rollers about 12 inches long and a foot in diameter geared together with an endless screw at the top, and set in motion by a lever to which a pair of bullocks are attached, is set up at some convenient spot, and a shed erected near by to shelter the boiling pan. Two men attend to the mill and drive the cattle, which are changed every four hours. The cane is passed through the mill in one piece, two canes generally being passed at the same time. The juice is collected in an earthen pot and transferred to the boiling pan from time to time. The pan is made of sheet iron riveted together and about $5\frac{1}{2}$ to 6 feet diameter, flat-bottomed and about 18 inches deep. When about six pots of juice have been collected, heat is applied to the pan and to the juice lime added at the rate of $1\frac{1}{2}$ lb. for 400 to 500 lb. juice. The juice is poured from the pots into the pan through a bamboo sieve to remove particles of the cane, &c. It is then boiled for about three hours, by which time it will be thickened to syrup, and it is then tested as to its readiness for transfer by throwing some of the syrup into cold water, when it will, if it is ready, become tolerably firm. The syrup is then poured out into an earthen pot; and from that, after being kept stirred for a quarter hour, it is poured into moulds made on the ground which are lined with matting and left to cool and set.

Jaggery making.

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In some cases, the syrup is poured direct from the pan into the moulds, but if required for domestic use, it is always poured into and kept stirred up in the pot for a time first.

35. A mill costs about Rs. 30, and the rollers last two years, when it costs Rs. 15 to replace them. A pan costs almost the same sum and the bottom will need to be replaced after two years wear at a cost of Rs. 10, the rest of the pan lasting for 10—12 years.

36. *Unirrigated Land.*—Although my tour was confined almost entirely by travelling by canal, yet near the head of both deltas, there is a considerable area of land which is too high for irrigation from the canals, and in other parts patches of unirrigated land are to be found which are far better suited for the growth of unirrigated crops than for paddy, which is almost the sole resource of the ryot when he once begins to irrigate. The lands which are devoted to unirrigated crops are for the most part stiff heavy clays, and the ryot is, in my opinion, quite right in preferring not to turn them into a paddy swamp. The crops on them are certainly more dependent on the local season, but in not infrequent cases, if the rains fail utterly, a watering can be given with canal water at a low charge, so they are saved. It is, however, a great pity, in my opinion, that the water-rates are not divised for application to different crops, for undoubtedly they are now too high for some and lower than others should legitimately pay. Some arrangement by which the ryot paid more nearly for the water he actually uses would be very beneficial.

37. On these lands it may be said that in both districts there are three classes of crops, the early, the great, and the late; they are as follows:—

Panasa or the Early.	Pedda or the Great.	Paira or the Late.
Maize	Paddy	Maize.
Korra	Red-gram	Ragi.
Gingelly	Cotton	Bengal-gram.
Sazza	Jonna or cholum	Horse-gram.
Samai	Green-gram	Black-gram.
Ragi	Alasandulu	Annumulu.
	Indigo	Boburlu.
		Castor.
		Coriander.
		Chillies.
		Tobacco.
		Vendium.
		Mustard, &c.

The early crops are sown with the first rains in June, the chief before the end of September, and the late crops, which are chiefly dependent on dew and the moisture already in the soil, are put in in November and December after the north-east monsoon rains. These crops are in the main common to both districts, with such exceptions as I have noted below. The early crops were on the ground at the time of my tour, but I saw little or no sazza, samai or ragi; the great crop was partly sown; of the late crops, of course I saw nothing.

Unirrigated paddy.

38. The agricultural statistics, such as they are, show that by far the most important crop on these lands is unirrigated paddy; for in the Godávari district there are said to be 102,000 acres occupied by it, and in the Kistna 148,000. In the latter district, however, jonna is a very important crop, occupying a larger area than the irrigated and unirrigated paddy together, but this crop is raised most largely in localities which I did not visit.

This paddy is chiefly of two varieties called Budama and Yellama, and is only irrigated if the rains fail entirely. It occupies the land three or four months and is frequently sown mixed with cotton and red-gram (*Cajanus Indicus*). In the Godávari

it is always sown broadcast, whilst in the Kistna the common practice is to drill it. In the Godávari about 35 lb. of the paddy and a small quantity of the others is sown together in July, the red-gram only growing up after the paddy has been harvested and the cotton coming on later still. In some parts of the Kistna I saw the paddy sown amongst the maize crops, and both are attacked by a grub called *Laddipurugu*, which devours the roots and thus kills the plants. Its attacks are worst when the rains are scanty or badly distributed, so that a time of draught comes whilst the crops are still young. I obtained some specimens of this grub, but have yet to discover what it is. This crop is not manured to any great extent, and there is nothing very noticeable in its cultivation. I was told in one place that this paddy drops 40 seers per putti of 320 seers in cutting, probably owing to being overripe.

39. *Maize* is grown to a considerable extent on the dry lands of the Kistna delta, being sown both as an early and as a late crop. The crop is generally manured, and what I saw promised well, although sown rather too thickly, if it developes fully. Judging from the samples of the grain that I saw, it is of fair size, and I was informed that usually 2 or 3 cobs were obtained from each stalk. It is peculiar that this crop is not raised on similar lands in the Godávari.

40. The other chief cereal crops raised on the lands are korra (*Panicum Italicum*) and jonna (*Sorghum vulgare*), but they both appeared to me to be raised more on the loamy soils, the stiffest clays being reserved for the unirrigated paddy. Korra is sown as an early crop and alone, and there is nothing particular in the mode of cultivating it.

41. *Jonna* is sown in September, green-gram and alasindulu being mixed with it. One thing only I noticed regarding its cultivation worthy of remark, and that was that the system pursued appeared to be much more thorough in the Kistna than that adopted in Bellary, the guntaka not being almost solely relied on, but relegated to its proper position. Jonna is also grown on some of the lanka lands. Ploughing for the crop begins with the rains in July and goes on till September. The seed is then sown in the Kistna by the drill, generally at the rate of about 14 lb. per acre ; if broadcasted 17—18 lb. are sown. The crop is also sometimes sown for fodder, when about 25—28 lb. are then sown. The seed is covered by the guntaka when the drill is used.

42. At Ellore I was informed that this crop is attacked by the following diseases :—

(1) *Nata pupi.*—Apparently a borer which penetrates the stalk below the ears. The same insect is said in the Kistna to attack maize and suzza (*Pencillaria spicata*) also.
(2) *Katukakanki.*—Apparently smut.
(3) Rust.

43. The crop is reaped whole and the ears are afterwards cut off and threshed out. The following figures were given me at Ellore for the cost of these operations on 12 acres :—

	RS.
Reaping	7 to 8
Ear-cutting	15
Threshing	2 to 3

44. *Gingelly* is also grown extensively on these soils. It is sown in June with the first rains at the rate of about 4—5 lb. per acre broadcast, and the plants are afterwards thinned out to about one for every 6 inches. It is considered fit to cut when the leaves begin to drop and the lower pods open ; after cutting, it is piled in a heap to ferment slightly and then spread out to dry, threshed with sticks, winnowed, and sifted. Should rain fall on the heap, it is said it had better be left undisturbed, but rain is apt to injure the seed by causing it to germinate.

45. *Indigo* is grown to a limited extent in one part of the Amalápuram taluk, and around and near Bezváda I found a large area under the crop. It is sown generally

broadcast in July and August and very much too thickly, about 20—25 lb. of seed being sown per acre. Only one cutting appears to be obtained. The crop is a valuable one, but precarious, and the chief profits go into the hands of the manufacturer. The ryots sometimes manufacture the dye, but generally it is done by some merchant or sowcar. The refuse is used for fuel and only to a small extent as manure. The crop might, I imagine, be most profitably raised on the wet lands as is done in Cuddapah.

46. Sometimes gingelly and indigo are sown together, and the former coming to maturity first is harvested before the latter is ready to cut.

47. Indigo when young is sometimes destroyed by caterpillars, and the ryots have strong convictions as to the injurious action of certain winds on the crop; thus, a south wind is said to be injurious and an east to spoil the dye, whilst a west wind is beneficial. The probable explanation is that the injurious winds are those which bring unseasonable weather with them.

48. Indigo is also grown to a considerable extent on the Godávari lankas for seed, a large quantity of which is exported, and the growth of which is said to be very profitable. This crop appears to me to be probably a very good substitute for tobacco, if the ryots could be induced to give the lankas a rest from that crop with the special object of endeavouring to get rid of the bôdu (*vide* my report thereon).

49. Of the late crops, of course, I saw nothing. They are chiefly pulses and special crops. The Bengal-gram is grown on the stiffest soils, the horse-gram on the lighter ones. Chillies were being sown in seed-beds at the time of my visit, and would be planted out in September or October. The land for this crop receives a large proportion of the available manure and is treated in much the same way as that prepared for tobacco in the Kistna, where the chillies are chiefly raised. Of coriander, which is an important crop in the Kistna, I have no notes, but it must be remembered that I only saw a part of the district.

50. *Tobacco.*—In my report on the parasite called bôdu, I gave a full description of the system of growing tobacco followed on the Godávari lankas. The tobacco crop, a very important one in the Godávari district, is, according to the agricultural statistics, still more so in the Kistna. In the last-named district it is grown not only in the lankas of the river, but around most of the villages. The system of growth in the Kistna is practically the same as in the Godávari, except that the land not being naturally fertilized by river-silt, needs heavy manuring, and, in fact, the land devoted to tobacco and chillies receives nearly all the ryots' manure. The tobacco land, however, is made to furnish manure to other fields in some places, for the soil is dug out and carried off to them as manure; this soil is doubtless very rich, not only from direct manuring, but also from being situated close to the village-site. Folding with cattle is the favorite means of manuring, combined with the use of village-ashes and sweepings, the latter being especially used for the seed-beds. I found cattle being folded one to every nine square yards, and kept in one spot for three or four days. Reducing this to sheep per acre for one night would give a result of about 8,000, which is heavy manuring. The land is prepared and the seedlings raised in much the same way in both districts as is the age for, and mode of, planting out. When the flower shows, the plant is topped and thereafter suckered as required until it is ripe for cutting. When the tips of the leaves begin to dry the leaves are cut, in some places separately from the stem, and in others with a portion of it adherent. They are then generally laid out on straw in the shade for a couple of days and then strung up on strings close together for a fortnight or three weeks in a shed; after this they are placed in heaps and turned daily for about three weeks, then moistened, piled in larger heaps and turned once in two or three days for another three weeks, by which time they are ready for sale. The lanka tobacco is said to be finer than that grown on the village-sites, and therefore not so much appreciated by the ryots, who prefer a coarse strong article.

51. It appears to me that, with so extensive a system of growing tobacco, there ought to be a good opening for a profitable speculation in curing the leaf for the European market. At present there is a great export of leaf to Burmah for manufacture into cigars, but it seems to me that it should be possible, with properly trained hands, to turn out a higher class leaf or cigar which would command a good price in the European market. At present the chief fault of the leaf lies in the manner it is cured, but, aided by skilled curers, there should be a better opening for speculation in this respect even than has been found to be the case at Pusa, in Bengal. It should be a very easy matter to arrange to take the green or half-dry leaf off the hands of the ryots and to cure it in central factories.

52. The parasite bodu is to be found in the Kistna district as well as on the Godávari lankas, and not only on the lankas, but also on the crops grown near the villages.

53. *Betel.*—At and around the village of Kollipara, in the Répalle taluk, a good deal of betel-vine is grown. This crop is very valuable, but needs a great deal of very careful attention and is grown on the co-operative system, ten or more ryots clubbing together to cultivate a plot with it. It is to all intents and purposes a garden-crop, and occupies the land for three years, after which the land is left waste for another three years to recuperate. A well is required closely, as the crop needs watering all the year round, unless there is abundant rain. The soil at Kollipara is a deep rich strong loam and is prepared first by folding sheep closely on the land and then by a large number of ploughings. After this it is sown with agati seeds in lines 2 feet 6 inches apart alternately. When the agati is two months old, cuttings from an old vine are planted and watered daily henceforth, watering going on continuously. The stem of the vine is twined round and round the agati till it reaches the top and then turned down and twined round and round again but downwards, and layered at the bottom. The crop of leaves will be ready for gathering in from six to twelve months. During the three years that it stands, the crop is manured three times. The gardens are most carefully fenced with *Erythima Indica* and several rows of plantain trees, besides palmyra-leaf tatties, to keep out the hot winds which are very injurious.

54. *Implements.*—In the Godávari district the only implement in use is the native plough, and this, together with a mamutti, crowbar, a small spud for weeding, called tolica, and a rough wooden spade, forms the stock of the ryot.

55. In the Kistna, on the other hand, the ryot is well off. He has the ordinary plough and he has besides the guntaka, the gorru and drill, the pápátam or *danthi*, besides the usual tools, for his work. I do not consider it necessary to refer more fully to these implements, as they are in all essential respects the same as those referred to in my Cuddapah and Bellary reports. It is, however, strange that, in so closely adjoining districts and with people of the same language, there should be so marked a difference in the implements of husbandry. I am unable to account for it.

Swedish ploughs.

56. In several places I found specimens of the Swedish ploughs imported by Government, and I have already reported my opinion of their unsuitability for use in the Godávari district. In the Kistna district, however, the cattle are much finer, and in many places that I visited they are fully up to working them and the ploughs, except for a few defects already pointed out, are well suited for the district. At Bezváda I took a good deal of trouble in trying to teach the workmen of a native merchant there how to use these ploughs, and I think successfully. This merchant had purchased six of the Swedish ploughs for use in preparing land for indigo and already had found them very useful. Although it is not the practice to use nose-ropes in the district, he had got over the difficulty of driving the cattle by fastening a rope to their horns; on the whole, I think this independent venture likely to be productive of profit to the merchant and good to the country itself. One private experimenter can do more good in a year than all the efforts of Government spread over many seasons.

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57. One thing my inquiries has convinced me of is that, in ploughs for ordinary use in this country, no bolts and nuts should be used, at least in the wearing parts; for at present no village blacksmith can or has the tools to turn a screw and make a nut. Another belief which this tour has confirmed me in is the tremendous cost of working with a native plough, whether in puddle or on unirrigated land, for I believe now that the usually published estimates of the cost of doing work with the native, so called, plough as compared with that done by an improved one are far too favorable to the former. For instance, at Kollipara, in the Kistna district, I was informed that it took a pair of the good cattle there fifteen days' work to prepare an acre of land for jonna, and was shown some of the work. I am certain that the work might be done by the same bullocks in three days with a good improved plough. Or again, at Pulletikuru, in the Godávari district, a ryot showed me two acres of land which he had had dug up by hand 7"—8" deep for Rs. 20. I should be glad to undertake to do such work with an improved plough for Rs. 5 per acre. In referring to improved ploughs, I am not, it must be remembered, referring to the type kown as "the improved country plough," but to ploughs of European or American type generally. Again, I believe that little good can be done towards introducing them unless very carefully devised exhibitions of the working of improved ploughs are conducted generally throughout the country, and I am convinced that such exhibitions would be productive of vast benefits to the country at large and to the ryots in particular.

58. The ryots have an absurd dread of the draught of improved ploughs, and this is too generally confirmed by their over-driving the cattle whenever an exhibition of one of these ploughs has been attempted; the natural consequence is that the bullocks soon get exhausted. They are first nearly frightened out of their wits by a hallooing and gaping crowd and then over-driven. Another thing I am certain of, and that is the absurdity of the old idea that it is necessary for the ryot to be able to twist the tail of his bullocks when ploughing; in these districts he drives almost entirely with a goad, and very cruelly, too, at times when doing his own work in keeping them moving through the heavy puddle of the paddy-lands.

59. An ingenious and simple water-lift, called the káremu, attracted my attention. I had not met with it before this tour, and it seems well adapted for low lifts, say up to four feet. It is in principle the same as the picottah, only instead of a bucket being filled and lifted, the trunk of a palmyra tree is hollowed out, excepting at one end, and is dipped into a stream or pond filled and then elevated at the closed end. When thus elevated, the water runs to the opposite end and thence into the channel that conveys it to the field where it is required.

60. *Live-stock.*—In the deltas, cattle and buffaloes are almost the only stock kept, although flocks of sheep and goats are met with occasionally. In the Godávari district the cattle are very miserable specimens, and what there are suffer considerably from deficiency of pasture at certain times of the year. In the lower parts of the delta as soon as the paddy has been put in, there is absolutely no grazing at all available, and the supply of straw from the previous year's crop is generally by that time exhausted. The cattle are driven off to waste lands inland and elsewhere for pasture, but the losses annually are very great, and the delta ryots have to incur heavy expense in replacing the death-vacancies. In this district the cattle are utterly incapable of working the Swedish ploughs sent out to the taluks for exhibition. On this point I have already reported.

61. In the Kistna, and especially on the western side of the river, the cattle generally met with are of a very good type and well up to drawing improved ploughs, after a little training to accustom them to the difference in the mode of attachment to the plough. Nevertheless, I was informed that the ryots complained of the Swedish ploughs as being too heavy for their cattle. This may in a great measure be due to ignorance of the way to use the ploughs and from the cattle being unaccustomed to them.

Cattle-breeding.

62. There is not much cattle-breeding in the taluks I visited, except in the Kistna district. There, although I found that some care is taken in crossing the

cows with particular bulls, it is hopeless to expect much improvement in the breed as long as certain customs remain in force. The ryots there do certainly raise an appreciable area of jonna and also some horse-gram for fodder, but this is chiefly used for the working cattle. The chief obstacle, however, to improving the breed of cattle, besides the want of a regular supply of fodder or grazing all the year round, is the practice of allowing all bulls to run uncastrated till they are four or five years old. As long as this custom goes unchecked, no solid improvement can be easily and generally effected. Of course the bullocks grow up into finer and more muscular animals, if left uncastrated till four years old, but before that age they can do a great deal of damage by serving cows and so producing inferior progeny. One of the best ways of improving stock is by introducing good sires, and Government might do much in this direction; but it will be useless to attempt anything until all young bulls are compulsorily castrated before they are two years old, unless specially licensed as sires. At present, even supposing the bulls to be well looked after, if Government were to think of introducing any, the risks would be too great to render it worth while.

63. I found buffalo cows being worked in one place, and was informed that if they were barren it is a common practice to work them for a time, it being found that they often again became fertile if this is done. Cows in the same state are not worked in the fields, but are used as pack-animals, which really amounts to much the same thing.

64. *Manures.*—I have already adverted to this subject in a measure, but may here remark that in these districts, as elsewhere, the main stay of the ryot in this respect is cattle-dung. The supply is very limited and it is further curtailed by the common practice of collecting and using cattle-dung for fuel. In one respect the ryots perhaps obtain more manure from their cattle than in other districts I have visited, and that is by folding them so generally on the land during the season that there is no crop on it; by this means the urine is not wasted. But, taken altogether, the supply from this source is very small, and after supplying the seed-beds and gardens there is little left, and what there is is too often weather-worn of all its valuable properties.

65. In some places saltpetre earth is collected from the walls of the houses and applied as a manure; this is not uncommon in the case of sugar-cane, but there seems to be some doubt in the minds of the ryots as to the advisability of using it for this crop. I brought away a sample of this earth from Bhímavaram, and hope to get the amount of saltpetre in it determined. Bats' dung and gingelly cake are said to be used in some places, and in the eastern delta of the Godávari considerable quantities of castor cake are, as already mentioned, obtained from Cocanada and used as manure. Nevertheless, when all the sources of supply are considered, the amount available is very small, and the land could not go on producing the crop it does were it not for the fertilizing silt brought down to it annually in the irrigation water; the paddy-crops get most of this and do not pay for it in proportion.

66. As elsewhere, bones are not used as a manure, but they are collected for export. The objections of the ryots to using them at present seem almost insuperable, and, being a slow-acting manure, it will be difficult to get them to understand their value.

67. At Rajahmundry I found the night-soil obtained from the town being given away to some Native Christians, who, acting on the advice of their pastor, were taking it willingly, and will probably reap a rich harvest there from before the ordinary ryots awake to the value of the article. With the financial success in disposing of night-soil at Poona before their eyes, it seems strange that the municipalities in this Presidency do not make more efforts to endeavour to work it up and recoup themselves something out of the expenses of conservancy.

68. Leaf-manure is not in common use in either district, and I have already adverted to the scope there is for growing it. In several places where I mentioned the fact that it was used elsewhere by the ryots, they appeared considerably astonished and rather incredulous. Besides the kanugu, I saw several other weeds

and shrubs, used elsewhere for manure, growing freely in several places, and in some places the irrigated lands must be within an easy distance of waste lands which undoubtedly will have thornless shrubs, &c., growing on them, which could be used as manure if desired.

Agricultural class.

69. *Miscellaneous.*—When at Rajahmundry, I visited the Provincial College at the request of the Principal, with a view to discussing the possibility of starting an agricultural class in it. Mr. Metcalfe is much in favor of a class being started, and the place seems to me a most suitable one, and it is highly desirable that such classes should, at first at least, be started where the head of educational institution is disposed to take some trouble in the matter himself. Mr. Metcalfe and I both agreed, however, that it would be of little use starting an agricultural class unless some small area of land were taken up at the same time for showing practically what farming operations are and how they should be performed. There is land conveniently situated close to the college, which might probably be easily obtained for the purpose, and which appeared to me from a casual inspection likely to be suitable.

The ryots.

70. Situated and favored as they are, there is but little prosperity to be seen in the two deltas; but, even with all that, it is only comparative, and the closeness and hardness of life must press heavily on the ryots here as elsewhere. Living, as they generally do in mud-hovels, on sites only a few inches above the level at which water stands in their fields, it is surprising that the people of the deltas are not more unhealthy. The cattle suffer, however, greatly from want of space in the village-sites, and, when the whole country is under water, crowd them up very badly, and in a manner that must be very insanitary. The cattle of course suffer from the absence of grazing and deficient food at one time and from feeding on rank quickly-grown herbage at others. The manure heaps of sweepings, ashes, &c., as usual surround the houses, and are only a few steps removed from the store-houses of grain. The whole effect is to impress one with the difficulties which must be met in any attempts at reform, not so much for the innate conservatism of the ryot as from the state he is, even under favorable circumstances, to be found in from his poverty and his ignorance.

The laborer.

71. With the farmers in such a condition, what must be that of the farm-laborers? When men have to subsist with their families on four seers of paddy a day, ten sheaves of paddy at harvest, one cloth, and one rupee for toddy, if there are no palmyras in the ryots' fields, per annum, and the requisite materials for a hut, together with small gifts at a marriage or death in his family, what must his state be? If the laborer gets all his rights, they may be worth Rs. 4 per mensem, but he is almost always in debt to the ryot, having obtained advances of grain and never knows how his account stands. Of course the wives and children of the laborers may earn something during certain seasons, but the total additions to the family income cannot but be small.

72. In conclusion, I may explain that this report could have been submitted before, if I could have obtained clerical assistance; and also that it has not been submitted through the Collector, according to the orders of Government for such reports, because I do not know through which Collector it should be sent, and it does not appear worth while to make duplicate copies of it. Further, I have in this report not travelled beyond the scope of my Bellary tour report, because Government in their order thereon expressed their satisfaction with it in that respect. It has been a great satisfaction to me to see more of the Presidency and to learn more about the country, but I doubt whether, except in peculiar cases, it will be worth while my making further tours without some special objects of inquiry, the differences in the general practice of the ryots throughout large areas being so very slight and necessarily so from the simplicity of their means of cultivation. There is plenty of room for investigation, but it is not such as can be carried out during a rapid tour through any tract of country.

Endorsement by W. WILSON, Esq., Director of Revenue Settlement and Agriculture, dated Madras, 18th October 1883, No. 1405.

Submitted to the Board of Revenue.

2. Advantage was taken of the recent recess of the School of Agriculture to depute Mr. C. Benson on a tour in the Kistna and Godávari deltas.

Besides a general instruction to study the agricultural systems of these tracts, Mr. Benson was specially directed to make inquiries regarding—

(1) "Bodu" (*Phelipœa Indica*), a vegetable parasite which had caused great damage to the tobacco crop of the Godávari delta in the preceding season ;
(2) "Kodu," a widely-extended disease of the paddy-plant that had come to the Director's notice in the latter part of 1881 ;
(3) Sugar cultivation in the Godávari ; and
(4) To make, if possible, experiments in co-operation with the district officers in washing out by trenching and draining "Chandoo" from the soils in the Kistna delta affected by it.

3. Of the agricultural systems of these tracts, Mr. Benson writes that they present few, if any, new aspects, or any that have not been described in previous reports on other districts. Of paddy, the great crop of the deltas than which nothing else is often to be seen for miles, he can find nothing better to record than that it is a "supremely uninteresting system of cultivation." With far other eyes and with a deeper interest do the statesman and the administrator view those long, long miles of food.

4. Manure is but little used in either delta, except for the seed-beds, but it is admitted that, in the river-silt, nature has provided an effective substitute.

5. Mr. Benson's remarks as to the late period with reference to the water-supply at which tillage operations are commenced in the Kistna, cannot be received as universally correct. As a rule, tillage begins as soon as water is available in the channels. Nor is his observation that, in the Godávari, it is "seldom that any attempt is made to raise a second crop" more accurate. In 1882-83 the extent effectively irrigated for second crop in the Godávari was Acres 31,183, and the area of second crop is steadily increasing.

6. Mr. Benson notes that the implements used in the Kistna are more numerous and varied than in the Godávari, and finds this difficult to account for. The explanation is probably to be found in the differing nature of the soils of the two deltas; that of the Godávari is for the most part a fine open loam and more easily worked than the stiff clays of the Kistna.

7. According to Mr. Benson's information the indigo of the Kistna gives but one cutting a year, whereas, in fact, it gives generally two and sometimes three cuttings.

8. Mr. Benson bears testimony to the superior tillage of cholum in the Kistna as compared with Bellary.

9. In the matter of water-rates and in especial reference to turmeric and sugar-cane which, though on the ground all the year round, require on the whole much less water than paddy, Mr. Benson thinks it a pity that the charge should not be regulated with reference to the crop. This matter was fully discussed when an all-round-uniform charge per acre, without reference to soil or crop, was adopted as best suited to a system of separate land assessments and water-rates. To differentiate the charge according to crop, introduces more or less the principle of consolidated assessments which it was the declared object of the Secretary of State to get rid of in the case of the Kistna and Godávari anicut systems.

10. Mr. Benson's remarks on the returns from sugar cultivation may be dismissed, as he himself says that they are of "little value and only given in obedience to instructions." It would have been better, in the circumstances, not to have recorded them. Mr. Benson's account of sugar-growing in the Godávari is interesting. The extent of the crop in 1882-83 was Acres 13,875. It is not grown in the Kistna.

11. The pasture difficulty of the lower delta of the Godávari can probably only be effectually overcome by the growth there of special fodder-crops for cattle.

12. It is to be hoped that the results will be sufficient to induce the other ryots to follow the example of the Christians of Rajahmundry in the use of poudrette.

13. In reference to the proposed agricultural class at the Rajahmundry College, where, from the interest taken in the matter by the Principal, success might well be predicated, it is observed that agricultural classes have for the present been sanctioned for three places only, the instruction being theoretical only. Both Mr. Benson and Mr. Metcalfe deprecate the opening of a class without a small farm for the demonstration of farming operation, and as such annexes are not present within the contemplation of Government, the proposal to establish a class at Rajahmundry need not be discussed now.

14. On "Bôdu," "Kodu," and "Chondoo," Mr. Benson submitted separate reports. Notes on the two former matters have been drawn up in this department and are now in the press.

From Mr. Benson's report on "Chondoo," it appears to have largely disappeared and to be gradually yielding to continued irrigation and improved drainage, the only mechanical means probably that can be profitably applied to remedy it.

15. An extract from paragraph 51 of Mr. Benson's report in the matter of improvements in the curing of tobacco has been communicated to Messrs. Arbuthnot and Co. of Madras and Messrs. Roberts and Co. of Cocanada, firms both largely interested in Godávari tobacco, and a note on tobacco cultivation in the Kistna and Godávari deltas, compiled from Mr. Benson's report, is now going to press.

Resolution—dated 2nd November 1883, No. 3292.

Mr. Benson's report upon his tour in the deltas of the Godávari and Kistna will be submitted to Government.

2. The Board concur in the observations made by the Director of Agriculture upon the report. Mr. Benson's tour would probably have resulted in fuller and more accurate information if the time at his disposal had not been so limited.

3. As Mr. Benson was at Bezváda and at Chebrole, it is to be regretted that he made no excursion to the uplands around Guntúr.

4. The recent very great extension of the cultivation of indigo in that part of the country might have afforded materials for remarks more valuable than those recorded in paragraphs 45 to 48 of the report. The Board do not understand upon what data Mr. Benson writes: "The chief profits go into the hands of the manufacturer. The ryots sometimes manufacture the dye, but generally it is done by some merchant or sowcar." Mr. Benson appears to have drawn this general deduction from the solitary instance of Mr. Ethirajalu Pillai, an enterprising merchant at Bezváda. On the Guntúr side of the river he would have found that a large profit goes to the ryot who sells the leaf, so much so that the cultivation of indigo has extended so widely that in some villages there is difficulty in finding straw for the ploughing-cattle. In these villages the vats usually belong to the ryots themselves, and the merchant or sowcar is only the broker who purchases the manufactured article for export.

5. So also with regard to the cultivation of the castor-oil seed which Mr. Benson has passed over almost without notice. This plant covers more than 100,000 acres in the Kistna, and the recent introduction of machinery at Guntúr, to express the oil locally, is an interesting and promising enterprise which would have been worthy of notice had Mr. Benson visited Guntúr.

6. The cotton cultivation in the western part of the Kistna district and the large breed of cattle well able to draw a heavy plough were also subjects to which attention might have been given.

7. With regard to the remark that by cutting the paddy too ripe there is a loss of 40 seers in a putti of 320 seers, which would be one-eighth of the produce,

the Board remark that nowhere is the putti so small as 320 seers. The Godávari putti is 800 seers, the Masulipatam putti 960 seers and the Guntúr putti 1,200 seers, so the loss, though heavy, was only one-twentieth or one-thirtieth part of the crop.

(A true Copy and Extract.)

(Signed) G. MACKENZIE,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Director of Revenue Settlement and Agriculture.
„ „ Collector of Godávari.
„ „ „ of Kistna.

Order—dated 11th January 1884, No. 28, Revenue.

Miscellaneous.

The Government have perused with interest Mr. Benson's report of his tour in the Kistna and Godávari districts and concur in the observations made thereon by the Board of Revenue and the Director of Revenue Settlement and Agriculture.

2. The usefulness of leaf manure and the desirability of growing the Kanuga tree* for the purpose, should be made known to the ryots, and the attention of the Collector of the Godávari district should be specially drawn to paragraph 10 of the report.

* Paragraph 5.

3. Brief extracts from the reports on "Bodu" and "Kodu" and such other subjects might with advantage be translated and published in the District Gazettes. The Director will, in communication with the Collectors of the districts concerned, report on the expediency of the special investigation into paddy diseases recommended† by Mr. Benson.

† Paragraph 16.

4. Mr. Benson's opinion in favor of the temporary substitution of indigo for tobacco in the Godávari Lankas should also be brought to the notice of the ryots.

5. The Director will submit after communication, if necessary, with the Collectors concerned, his views on Mr. Benson's proposals in paragraphs 57 and 62 of his report in regard to the establishment of ploughing exhibitions and the improvement of the breed of cattle.

(True Extract.)

(Signed) E. S. LAFFAN,
for Secretary to Government.

To the Board of Revenue.
„ the Director of Revenue Settlement and Agriculture.

Exd. W. H. French.

70 Copies.

G. O. No. 209/84

Govt. of (1884) Madras.

REVENUE.

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nmunicated to the Officers in charge of Settlement Parties, to Agricultural Reporter and to the Inspector of Cattle Diseases.

ot. of Rev. Sett. & Agre. dras 12 February 1884

(By order)

[signature]

1st. Assistant

The Dy. Director of Rev. Sett. Party No. III

G.O., 11th January 1884, No. 28.

JANUARY.

செப்பனிடுபவர் பெயர்
வே. சுப்பிரமணியன்
செப்பனிடுவதற்காக எடுத்துக் கொள்ளப்பட்ட நாள் 7/2002
செப்பனிட்டு முடிக்க நாள் 8/2002
16/9/02
சரிபார்க்கும் மு. நி. பா. கையொப்பம் 17.9.2002
21/10/02

Mr. Benson's Report of his Tour in the Deltas of the Godavari and Kistna Districts.

Reviewing —.